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## Non-career firefighters in rural areas - Exploring aspects contributing to retention

Lantz, Emelie

2022

*Document Version:*

Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for published version (APA):*

Lantz, E. (2022). *Non-career firefighters in rural areas - Exploring aspects contributing to retention*. Lund University.

*Total number of authors:*

1

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# Non-career firefighters in rural areas

## Exploring aspects contributing to retention

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DIVISION OF FIRE SAFETY ENGINEERING | FACULTY OF ENGINEERING | LUND UNIVERSITY





# Non-career firefighters in rural areas

Exploring aspects contributing to retention

Emelie Lantz



**LUND**  
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LICENTIATE THESIS


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To be defended on November 18th, 2022 at 13.00 in room V:C, V-huset, John  
Ericssons väg 1, Lund.

*Faculty opponent*

Jarle Løve Sørensen, Associate Professor in Emergency and Crisis Management,  
USN School of Business, University of South-Eastern Norway, Norway.

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|--|--|---|-------|
| <b>Organization</b><br>LUND UNIVERSITY<br>Faculty of Engineering, Division of Fire Safety Engineering  |  | <b>Document name</b><br>LICENTIATE THESIS   |       |
|  |  | <b>Date of issue</b><br>2022-11-18  |       |
| Author(s)<br>Emelie Lantz  |  | Sponsoring organization<br>The Kamprad Family Foundation for Entrepreneurship, Research & Charity (reg. no. 20202001), the Swedish Civil Contingencies (MSB) and The Swedish Fire Research Foundation (Brandforsk). |       |
| <b>Title and subtitle</b><br>Non-career firefighters in rural areas – Exploring aspects contributing to retention  |  |   |       |
| <b>Abstract</b><br><p>The majority of the firefighters in several countries are non-career firefighters (such as volunteer, retained or paid part time firefighters). Recruiting and retaining these non-career firefighters are often challenging. This is troublesome due to the high reliance of them, especially in rural areas. The lack of non-career firefighters, who often are the first-line responders to emergencies, can be a threat to public safety in rural areas. As population distributions and demographics in rural areas change, followed by difficulties to attract and retain non-career firefighters, it is vital to further understand factors contributing to a sustainable staffing situation in Fire and Rescue Services. The overarching aim of this thesis is to increase knowledge about the implications of working as a non-career firefighter in order to understand how challenges and commitment affect retention. The thesis had two research objectives; a) To investigate and describe the challenges of working as a non-career firefighter and b) To explore what contributes to the commitment of working as a non-career firefighter. The papers included in the thesis are (Paper I) a systematic literature review of existing research including different types of non-career firefighters. The review focused on factors affecting recruitment, retention and resignation. In addition, (Paper II) presents new empirical data of paid part-time firefighters' experiences in Sweden. The thesis results show that paid part-time firefighters share similar challenges as other types of non-career firefighters, such as finding the balance between work and family life. Further, the working environment affects non-career firefighters' experiences of the job and has an impact on commitment. The results also show that non-career firefighters share similar reasons to stay committed to the service. Cohesive groups are important and contribute to continued commitment, regardless of for example, being a volunteer or a paid part-time firefighter. The thesis results highlight complex and multifaceted experiences between commitment and challenges. New empirical results from Paper II are presented in relation to previously literature from Paper I, and a discussion is also made regarding how the results can be of importance for practitioners.</p> |  |   |       |
| <b>Key words</b><br>Fire and Rescue Service, Firefighter, Part-time Firefighter, Retention, Commitment, Non-career firefighter   |  |   |       |
| Classification system and/or index terms (if any)  |  |   |       |
| Supplementary bibliographical information<br>ISRN LUTVDG/TVBB--1071--SE<br>Report 1071   |  | <b>Language</b><br>English  |       |
| <b>ISSN and key title</b><br>1402-3504   |  | <b>ISBN</b><br>978-91-8039-446-8 (print)<br>978-91-8039-445-1 (pdf)   |       |
| Recipient's notes  |  | <b>Number of pages</b><br>62  | Price |
|  |  | Security classification   |       |

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# Non-career firefighters in rural areas

Exploring aspects contributing to retention

Emelie Lantz



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Paper 1 © International Journal of Emergency Services

Paper 2 © International Journal of Emergency Services

Faculty of Engineering Department of Building & Environmental Technology  
Division of Fire Safety Engineering

ISBN 978-91-8039-446-8 (print)

ISBN 978-91-8039-445-1 (pdf)

ISSN 1402-3504

ISRN LUTVDG/TVBB--1071—SE

Printed in Sweden by Media-Tryck, Lund University  
Lund 2022



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*To Vinnie, Allie & Björn*





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# Acknowledgement

I would like to thank the funding organisations and collaborating partners that made this thesis possible. The research in this thesis is conducted as a part of the Research School for Doctoral Students within the Swedish Rescue Services established by The Swedish Fire Research Foundation (Brandforsk). The Research School for Doctoral Students is an initiative to enhance the merging of research practice with practice and facilitate the use of research in the Swedish Fire and Rescue Services. I would like to thank the Centre of Interprofessional Collaboration within Emergency care (CICE) for valuable collaboration and support. Further, Paper II was funded by The Kamprad Family Foundation for Entrepreneurship, Research & Charity (reg. no. 20202001). I also would like to thank my employer, West Blekinge Fire and Rescue Service (Räddningstjänsten Västra Blekinge), for giving me the opportunity to pursue the studies as part of my work and the Swedish Civil Contingencies Agency (MSB) for funding and collaboration during the writing of the thesis.

Furthermore, I would like to thank my supervisors Håkan Frantzich (LTH), Marcus Runefors (LTH), Anders Svensson (LNU) and Bengt Nilsson (LNU). I appreciate your broad views and knowledge, nuanced discussions but foremost your support. I would also like to thank Carina Elmqvist and Bengt Fridlund for valuable input and support. Finally, I am very grateful to my family and friends that encourage me along the way.

# Summary

The overarching aim of this licentiate thesis is to increase knowledge about the implications of working as a non-career firefighter in order to understand how challenges and commitment affect retention. Retention of non-career firefighters (for example volunteer or part-time firefighters) is a well-known, multifaceted challenge in several countries.

These non-career firefighters account for the majority of Fire and Rescue Services staff, but it is a challenge to recruit and retain them. Non-career firefighters often serve in rural areas and are an important component of local community safety. Several factors have been suggested as underlying causes contributing to the complexity of retention challenges, mainly related to demographic changes. A fall in numbers of non-career firefighters may lead to fewer people having to undertake a higher workload to sustain local access to essential services.

Due to the difficulties attracting and retaining non-career firefighters, it is vital to gain a better understanding of the factors contributing to sustainable retention. There is a volume of research about volunteer firefighters, but few studies cover the context of other types of non-career firefighters' employment, such as part-time firefighters, in relation to retention. In Sweden, non-career firefighters mainly work as paid part-time firefighters in contrast to the internationally more common form of serving as volunteer firefighters. The service delivered by these firefighters is essential. Therefore, it is important to gain more knowledge of the firefighters' experiences to be able to minimise barriers, strengthen commitment and work towards ensuring long-term retention. This thesis provides additional knowledge about the current challenges. Part-time firefighters share challenges similar to other non-career firefighters, such as the balance between principal employment, the service as a firefighter and family life. Further, the working environment affects firefighters' experiences of the job and has an impact on motivation and commitment. A lack of appropriate facilities, old equipment and a culture without feedback and support can lower commitment.

The thesis results show that different employment types of non-career firefighters also share reasons to stay committed to the service. The papers appended show that cohesive groups are essential and contribute to continued commitment in the service, regardless of, for example, being a volunteer or a part-time firefighter. Another important factor contributing to commitment is the feeling of personal development. In other words, expanding a self-awareness and new perspectives in life.

# Sammanfattning

Det övergripande syftet med denna licentiatavhandling är att öka kunskapen kring vad som påverkar att jobba som en brandman vars huvudsakliga sysselsättning är utanför räddningstjänsten (exempelvis frivilliga brandmän eller deltidsbrandmän) för att förstå hur utmaningar och engagemang påverkar beslutet att fortsätta vara verksam. Bibehållandet av dessa brandmän är en välkänd utmaning i många länder.

Majoriteten av räddningstjänsternas personal är inte heltidsbrandmän, utan brandmän som gör detta på sin fritid. Dock är det en utmaning att rekrytera och behålla dessa brandmän. De tjänstgör ofta på landsbygden och är således en viktig del av det lokala samhällets säkerhet. Flera faktorer har föreslagits som bakomliggande orsaker som bidrar till den komplexa utmaningen med att bibehålla personal, främst relaterade till demografiska förändringar. På grund av långvariga demografiska förändringar upplever samhällen på landsbygden följaktligen effekter av detta som kan leda till nedskärningar i offentliga resurser. En minskning av brandmän kan leda till att färre människor måste ta på sig en högre arbetsbörda för att upprätthålla förmåga.

På grund av svårigheter att rekrytera och behålla dessa brandmän, är det viktigt att ytterligare förstå faktorer som bidrar till en hållbar personalförsörjning. Det finns en mängd forskning om frivilliga brandmän, men få studier innefattar andra anställningstyper, som exempelvis deltidsbrandmän. I Sverige är deltidsbrandmän i majoritet, i motsats till den internationellt vanligare formen av tjänstgöring som frivillig brandman. Eftersom den service som dessa brandmän tillhandahåller är viktig, är det angeläget att få mer kunskap om brandmännens erfarenheter för att kunna förstå vad som bidrar till en hållbar personalförsörjning. Denna avhandling ger ytterligare kunskap om de aktuella utmaningarna. Deltidsbrandmän och andra typer av brandmän delar liknande utmaningar, exempelvis balansen mellan huvudanställningen, jobbet som brandman och familjelivet. Vidare påverkar arbetsmiljön brandmännens upplevelser av jobbet och har en inverkan på motivation och engagemang. Oanpassade lokaler, gammal utrustning och en arbetskultur utan feedback och stöd kan sänka engagemanget.

Resultaten från avhandlingen visar att olika anställningsformer av brandmän även delar liknande orsaker till att fortsätta engagera sig. De inkluderade studierna visar att god sammanhållning i gruppen är viktigt för fortsatt engagemang, oavsett om brandmannen är frivillig- eller deltidsbrandman. En annan viktig faktor som bidrar till engagemang är känslan av personlig utveckling. Med andra ord, en utökad självkännet och nya perspektiv på livet.



# 1. Introduction

The aim of this thesis is to increase knowledge about the implications of working as a non-career firefighter in order to understand how challenges and commitment affect retention. The introduction provides background information about non-career firefighters and puts the current challenges in a wider context. This is followed by the terminology, the thesis aim and objectives, delimitations, publications and an outline for the thesis.

## 1.1 Background

Fire and Rescue Services (FRSs) are organisations that prevent and control fires and also respond to many different emergencies such as road traffic accidents, medical assistance, nature disasters and incidents involving hazardous materials.

An FRS is usually a public sector organisation that operates within a municipality, county, state or nation. FRSs may be organised in a variety of ways and having firefighters with different employment obligations and payment levels. In many European countries, the organisation model of the FRS is based partially or predominantly on non-career firefighters (Elbers, 2019). These non-career firefighters (for example volunteer, part-time, retained or on-call firefighter) may have different obligations and compensations, but the common denominator is that they serve in an FRS in addition to their principal employment. In this thesis, the term ‘non-career firefighters’ is a designated name for firefighters who serve in an FRS as an additional activity to their principal employment.

In several countries, for example in Australia, USA, Germany, Portugal and Sweden, non-career firefighters are considered to form the core of FRS staffing (Elbers, 2019; SOU 2018:54; Evarts & Stein, 2017; Degel et al., 2014; McLennan & Birch, 2005). However, recruiting and retaining these firefighters is often challenging (SOU 2018:54; Boezeman & Ellemers, 2008; McLennan & Birch, 2005). In the US, the rate of volunteer firefighters per 1,000 people protected is on a downward trend, from 8.05 in 1987 to 5.8 in 2017 (Fahy, 2021). Canada experienced a decrease of 12.2% in volunteer firefighters between 2013 and 2016 (Haynes & Stein, 2018). Australia has also experienced a reduction in the number of volunteer firefighters. The Victorian Country Fire Authority estimated a fall of



about 30% between 1988 and 2004 (McLennan & Birch, 2005). Furthermore, a rapidly decreasing number of young volunteer firefighters has been observed in Germany in recent years, leading to recruitment problems (Degel et al., 2014). Several factors have been suggested as underlying causes contributing to the complexity of these challenges, mainly related to demographic changes in rural areas. Community population sizes are decreasing and the percentage of the population aged 55 years or more is increasing (McLennan & Birch, 2005). Owing to long-term demographic change, communities in rural areas are experiencing the effects of rural restructuring, leading to declines in both government services and resources. The fall in the number of non-career firefighters is leading to fewer people having to undertake a higher workload in order to sustain local access to essential services (O'Halloran & Davis, 2020). A lack of non-career firefighters, who are often the first-line responders to emergencies and disasters, is a significant threat to public safety in rural areas (Yoon et al., 2014). In the USA, 95 per cent of all volunteer firefighters serve in departments that protect fewer than 25,000 people and 49 per cent are with small, rural departments that protect fewer than 2,500 people (Fahy, 2021). In Canada, most of the volunteer firefighters are in departments that protect communities with a population fewer than 50,000 (Haynes & Stein, 2018).

Non-career firefighters often have full-time paid employment while serving in an FRS as an additional activity, which means that they are balancing different commitments such as family life, principal employment and their work as a firefighter (Yarnal & Dowler, 2002). In addition to physical and medical requirements, non-career firefighters may also be required to both live and work within a certain distance from the fire station, which may be a limiting recruitment factor. Some non-career firefighters are also experiencing increased reluctance from their principal employers to let them attend call-outs (Elbers, 2019). In Sweden, non-career firefighters mainly work as paid part-time firefighters (PTFs) in contrast to the internationally more common form of serving as volunteer firefighters. In Sweden, PTFs need the consent of their principal employer to be involved with the FRS and respond to calls during working hours (SOU 2018:54). Unlike some volunteer firefighters, PTFs receive financial compensation for being on-call and additional compensation for mandatory training and call-outs.

In Sweden, a majority of municipalities comply with the European Commission's definition of rural areas (OECD, 2017). Rural areas in Sweden face the challenges of population ageing and declining population, leading to difficulties maintaining access to public services in remote areas (OECD, 2017). There is no declining trend of PTFs in Sweden, at least in the recent 20 years (MSB, 2021c). However, the majority of FRSs in Sweden state that they have difficulties recruiting new PTFs (MSB, 2021a). These difficulties may also be troublesome since firefighter call-outs in Sweden have increased by an average of 20 per cent in the last 20 years (SKR, 2021). Between 1998 and 2021, the number of road traffic accidents increased from

8,100 to 17,900 and incidents involving medical assistance while waiting for an ambulance increased from 3,600 to 12,900 (MSB, 2022). Between the years 2018 and 2021, PTFs were arriving first at the scene in 30 % of all accidents in an average (IDA, 2022).

The intention of the Swedish Civil Protection Act (SFS 2003:778) is to give all residents of Sweden adequate, equivalent protection against accidents, regardless of geographical location. Consequently, recruitment challenges of non-career firefighters in rural areas present a problem. Non-career firefighters are also used as an additional resource to Emergency Medical Services (EMS), to attend medical assignments when the ambulance is far away, which is a quite common concept in rural areas to shorten the response time (Raun et al., 2019; Svensson et al., 2017; Saner et al., 2013; Nordberg et al., 2015; Svensson et al., 2019). Fire stations in Sweden are organised operationally according to specific criteria for response times, generally leading to a higher density of fire stations with shorter response times in rural areas than EMS. Consequently, the challenges involved in retaining non-career firefighters may affect responses to both accidents and urgent medical situations.

Additionally, FRSs are called upon to respond to nature disasters such as flooding and forest fires. Climate change is expected to worsen, leading to more extreme meteorological events such as heavy rains, droughts, tropical storms and heatwaves which may, in turn, lead to high-impact events such as landslides, wildfires and avalanches (WMO, 2020). When disasters grow in frequency and intensity, the reliance on FRS staffing and expertise also grows, especially in rural and remote areas where most fire stations depend on non-career firefighters. Non-career firefighters provide in-depth local knowledge of their community (Landry et al., 2022). Furthermore, transitioning FRSs with non-career firefighters to paid services with career firefighters may not be a solution to solve all recruitment and retention challenges. A study by Freeman et al. (2009) about the recruitment and retention of EMS showed that there are different barriers to transitioning rural agencies from volunteer to paid services, related to e.g. organisational identity. Moreover, transitioning an organisation from non-career firefighters to paid firefighters is very difficult from a financial point of view. Dostal & Balarinova (2013) estimated the total annual gross economic value of volunteer firefighting to be millions of Euros in the Czech Republic.

Non-career firefighters are of great importance in rural communities. Quick access to assistance in case of emergency is vital to maintain a general sense of safety and security (Mojir & Pilemalm, 2016). However, there are many questions about how to successfully optimise firefighter motivation and secure commitment (West & Murphy, 2016). Commitment to the job is a distinctive motivational foundation for firefighters and is also a major factor determining their efforts (Lee & Olshski, 2002). Commitment refers to the sum of the forces, pressures or drives that influence people to maintain congruence between their identity and the identity others see in them (Burke & Reitzes 1991). Owing to the reliance on non-career firefighters,

several fundamental questions regarding how to sustain effective retention strategies need to be answered (West & Murphy, 2016). Understanding factors affecting retention is of both theoretical and practical interest, and of importance in realising the intention to provide adequate, equal protection against accidents.

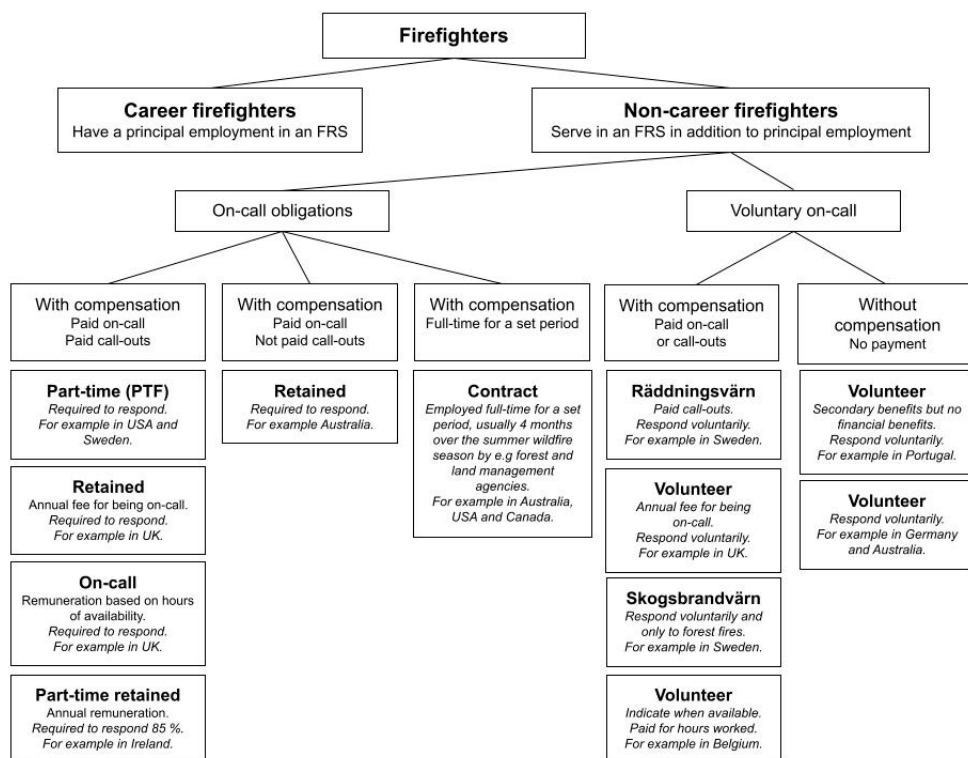
As population distributions and demographics in rural areas change, followed by difficulties in attracting and retaining non-career firefighters, it is vital to further understand factors contributing to a sustainable staffing situation in FRSs. There is some research regarding volunteer firefighters, but few studies cover other contexts, for example, the context of PTFs in relation to retention. The service delivered by non-career firefighters is of great importance. Therefore, it is critical to gain more knowledge of their experiences, to be able to minimise barriers, strengthen commitment and work towards securing long-term retention. This thesis provides additional knowledge about the current challenges and what contributes to commitment among non-career firefighters.

## 1.2 Terminology

There is no consensus regarding the terminology for different types of non-career firefighters. Several countries refer to the firefighters, who are not employed on a full-time basis, as ‘volunteers’, regardless of whether they have obligations and are paid or not (Dangermond et al., 2019). In Europe, the terminology for non-career firefighters ranges from ‘part-time’ (for example in Norway), ‘retained’ (for example in the United Kingdom), ‘part-time retained’ (for example in Ireland) to the more general term ‘volunteer’ (for example in France) (Elbers, 2019). In this thesis, the common denominator for non-career firefighters is that they serve in an FRS in addition to their principal employment. The level of compensation and obligations vary among non-career firefighters. For example, volunteer firefighters with no obligation to be on-call and no compensation in contrast to PTFs with requirements to be on-call within a specific proximity of the fire station, obliged to respond to calls and receiving payment by the hour. *See Figure 1.*

Since there is no consensus regarding the terminology, the term ‘non-career firefighter’ was established in reference to the group of firefighters who do not serve as career firefighters, instead of using the term ‘volunteer firefighter’. Other publications use the term volunteer regardless of whether the firefighters are compensated or not (Elbers, 2019). The term volunteer may be viewed as a somewhat limited concept since several types of firefighters receive compensation. According to the Cambridge Dictionary (2022), volunteer means “*a person who does something, especially helping other people, willingly and without being forced or paid to do it*”. There are also definitions of principles regarding volunteering such as (1) benefits for the community, (2) the work is unpaid, (3) it is a matter of choice

and (4) it is performed in the not-for-profit sector (Maher, 2005). Non-profit work may take place regularly or on one occasion and is voluntary, unpaid or with small compensation (Von Essen et al., 2020). Non-career firefighters may join willingly, but the work also entails compulsory measures and for some also financial payment. Consequently, this thesis distinguishes volunteers as a type of non-career firefighter but uses the wider concept of ‘non-career firefighters’ when discussing all types. However, the aim of the thesis is not to argue which terminology to use in the future.



**Figure 1.** The figure shows different terminology of firefighters, clarifying alternative working arrangements to the author's current knowledge. Note that the same term may also indicate different arrangements in different countries.

## 1.3 Aim and objectives of the thesis

The overarching aim of this thesis is to increase knowledge about the implications of working as a non-career firefighter in order to understand how challenges and commitment affect retention. In order to address this overarching aim, two objectives were formulated:

- a) *To investigate and describe the challenges of working as a non-career firefighter. (Paper I and II)*
- b) *To explore what contributes to the commitment of working as a non-career firefighter. (Paper I and II)*

## 1.4 Delimitations

The thesis does not aim to finalise definitions of different types of and terms for non-career firefighters. Sections 1.1 and 1.2 attempt to illustrate the wide range of types and terminology but the aim is not to investigate further or in greater depth how they differ in legal status, tasks, conditions and taxonomy.

Non-career firefighters and their important role in community resilience is a complex, multifaceted research topic. The goal was not to investigate firefighters' capability and performance, although this could be a dimension to take into account when evaluating the outcome regarding protection against accidents and community resilience. There are many perspectives and approaches to address in the research area. However, this thesis originates from an engineering perspective and not, for example, organisational psychology or behavioural theory, nor in socioeconomic values or resilience theory. It is based on practitioners' use of the knowledge and aims to address existing problems. Engineering science pursues the development of knowledge for practical use with the aim of achieving improvements (Meijer, 2009).

In addition, the research in this thesis has mainly been studied in the context of rural areas. Current challenges relate to demographic changes in rural areas, where mostly non-career firefighters operate. Rural areas may differ greatly in both geographical size and the number of residents.

## 1.5 Publications

This thesis is based on the research presented in the papers appended, which are listed below. The papers have been submitted to scientific journals and have been fully peer-reviewed.

- Paper I      Lantz, E., Runefors, M. 2020. *Recruitment, retention and resignation among non-career firefighters*. International Journal of Emergency Services. Vol. 10 No. 1, 2021 pp. 26-39. (DOI 10.1108/IJES-02-2020-0009)
- Paper II     Lantz, E., Nilsson, B., Elmqvist, C., Fridlund, B., Svensson, A. 2022. *Serving the community while balancing multiple*

The author of the thesis was actively involved in all the work carried out on the two papers. The level of responsibility and work involved were divided into the following categories:

|        |   |
|--------|---|
| Minor  | The author had minor responsibilities and performed a small amount of the workload (less than 1/3 of the responsibility and work)       |
| Medium | The author took medium responsibility and performed approximately half of the work (between 1/3 and 2/3 of the responsibility and work) |
| Major  | The author assumed the main responsibility and performed most of the work (more than 2/3 of the responsibility and work)                |

For each paper, five different steps were identified and the level of work and responsibility were graded. *See Table 1.*

**Table 1.** The author's contribution to the thesis papers.

| Step                                | Includes   | Level of responsibility and work |          |
|-------------------------------------|--|----------------------------------|----------|
|                                     |  | Paper I                          | Paper II |
| <b>1 Planning and preparation</b>   | Formulation of relevant research questions/aim and planning how to answer these. Includes preparation as well as writing applications for ethical approval | Major                            | Medium   |
| <b>2 Implementation</b>             | Performing data collection. Includes activities such as reading literature, collecting data and conducting interviews                                      | Major                            | Major    |
| <b>3 Analysis</b>                   | Analysing data. Includes systematically studying different forms of results to identify possible patterns and relating these patterns to current knowledge | Major                            | Major    |
| <b>4 Preparation of paper</b>       | Writing the paper, communicating with the editor and revision after review   | Major                            | Major    |
| <b>5 Presentation at conference</b> | Packaging all the above for presentation at conference   | -                                | Major    |

## 1.6 Thesis outline

*Section 1 (Introduction)* presents the background of the research area. This background leads to the formulation of the aim and objectives that this thesis sets out to address. The terminology, publications and delimitations of the current work are also presented.

*Section 2 (Method)* presents the methods, data collection techniques and data analysis used in the papers appended.

*Section 3 (Discussion of methods)* presents different quality criteria and discusses the methods in relation to the criteria. The section also presents the advantages, disadvantages and potential pitfalls associated with the methods and how the author has tried to address them throughout the research process.

*Section 4 (Research results and discussion)* presents the results of the papers appended and the knowledge contribution in relation to the thesis objectives, followed by a discussion of the results and their implications.

*Section 5 (Conclusions)* presents the conclusions that may be drawn from the results of the two papers appended in relation to the aim and objectives of the thesis.

*Section 6 (Future research)* presents recommended future research.

## 2. Method

This chapter provide information of the method, data collection and data analysis used in the appended papers followed by an ethical consideration. Respective section is divided in subsections referring to Paper I and then to Paper II in order for the reader to make comparisons regarding differences between them. A discussion of the methods is found in chapter 3.

### 2.1 Research methods

Research methods represent the way of studying the phenomenon of interest, in other words, the procedures employed to achieve the purpose of the study (Säfssten & Gustafsson, 2020). This thesis originates from a fire safety science and engineering context, although it also has influences from the field of social sciences. Quantitative characteristics are common in engineering science, ascribed to a high level of standardisation and formalisation, where the researcher relates to what is studied as an object with attributed measurable properties (Säfssten & Gustafsson, 2020). Qualitative research, which is common in social sciences, aims to provide an in-depth understanding of people's experiences and perspectives in the context of their personal circumstances or settings (Spencer et al., 2003). Qualitative research is usually exploratory, flexible and data-driven (Mason, 2018). It is characterised by exploring phenomena from the perspective of those being studied; with the use of methods which are sensitive to the social context of the study; the collection of complex and detailed data; a mostly inductive analytical process; developing explanations at the level of micro-social processes rather than context-free laws; and answering 'what is', 'how' and 'why' questions (Spencer et al., 2003).

The common denominator of the papers appended is an inductive approach, building patterns from the bottom up, primarily to generate knowledge of practical use. There are numerous approaches and paradigms surrounding qualitative research and they vary in terms of the ontological, epistemological and methodological assumptions on which they are based (Spencer at al., 2003). The paradigm, or worldview, which inspired the foundation of this thesis is influenced by pragmatism. Pragmatism focuses on the consequences of research, the importance of the purpose of the research and the use of multiple methods of data collection (Borglin, 2017). In other words, problems are addressed with a focus on



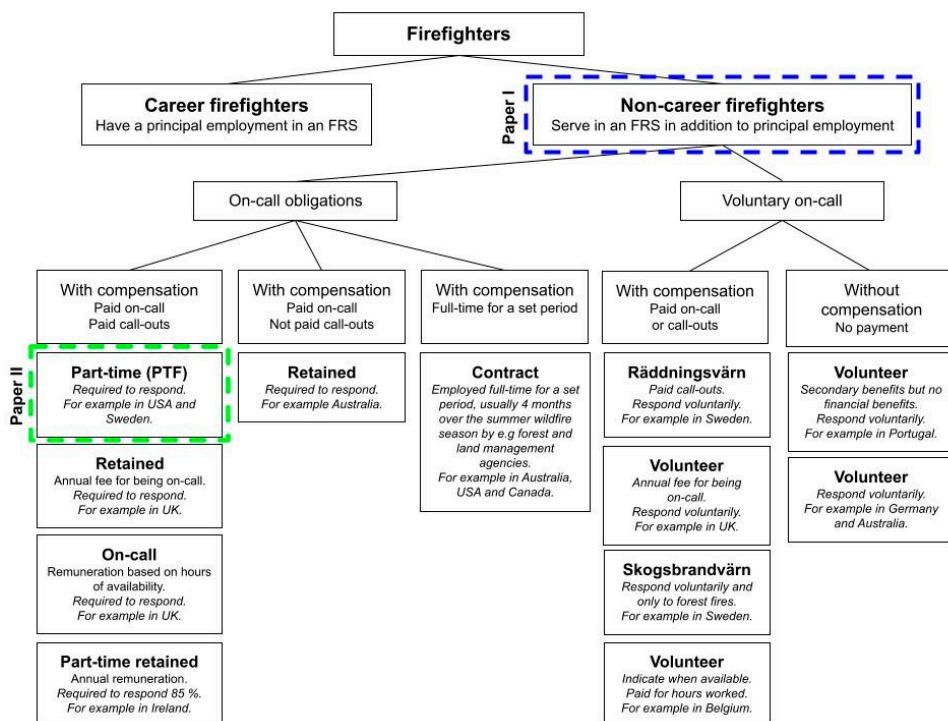
practical approaches and solutions, ones that will work in practice. In this case, the aim is for the consequences of this research to be directly useful for practitioners in an FRS.

The first step of the research process included a systematic search and review of literature related to recruitment, retention and resignation among non-career firefighters. The review covered several aspects and included different non-career firefighters. The review identified that most of the existing research originates from only two countries and the vast majority of the research includes volunteer firefighters. The literature review revealed areas on which future research should focus, and this allowed the next study to address this gap in research by exploring the Swedish context with PTFs, who are currently underrepresented in the literature.

Paper II takes its point of departure in human experience. Data based on human experience is complex and multifaceted and may often be interpreted on multiple levels. Qualitative research stresses the 'why' and 'how' of things rather than the 'what', 'where' and 'when', aiming to understand concepts, illuminate reality and estimate the similarity to other situations, rather than generalise or determine cause (Säftsten & Gustafsson, 2020). Paper II employs a qualitative approach, with in-depth interviews and latent content analysis. The aim of Paper II was to explore the experiences of working as a paid PTF. Table 2 shows an overview of the two studies. Figure 2 illustrate which firefighters respective paper address.

**Table 2.** Overview of the papers appended.

| Paper | Purpose/ Research question  | Context                                | Data collection                         | Data analysis                       |
|-------|---|--|---|-------------------------------------|
| I     | (1) What factors contribute to the recruitment of non-career firefighters?<br>(2) What influences non-career firefighters' decisions to remain in the organisation?<br>(3) What factors may contribute to resignations among non-career firefighters? | Peer-reviewed international articles   | Peer-reviewed articles included (N= 27) | Systematic review                   |
| II    | To describe experiences of working as a paid part-time firefighter in Swedish rural areas.  | Part-time firefighters in rural Sweden | Individual interviews (N=18)            | Qualitative latent content analysis |



**Figure 2.** Paper I address non-career firefighters (blue box) and Paper II address PTFs (green box).

## 2.2 Data collection techniques

Data needs to be collected to provide a basis for analysis regardless of the research method. Different data collection techniques have different strengths and weaknesses. Using different data collection techniques may give the findings more depth and meaning. The data collection techniques used in the papers appended, are described in this section. See chapter 3 for a discussion of methods in relation to quality criteria.

### 2.2.1 Paper I – Literature review

Paper I used a literature review as a data collection technique. Common reasons to perform a literature review are to summarise existing evidence concerning a topic, to identify gaps in current research in order to suggest future research areas and to provide a framework or background in order to position new research activities (Kitchenham, 2004). Literature reviews have been defined as mapping out and

reviewing current and relevant literature (Säfsten & Gustavsson, 2020). They are typically applied in the first exploratory phase of investigating a phenomenon in order to acquire an initial picture. A systematic literature review has strict reliability requirements and needs to have transparent, clear inclusion and exclusion criteria (Rosén, 2017).

In this thesis, a systematic literature review was undertaken in the initial stage to gain a greater understanding of existing knowledge. The aim of the review was to get an initial idea of and overall perspective on factors relating to why non-career firefighters join, stay and resign from their service in an FRS. Three research questions were formulated:

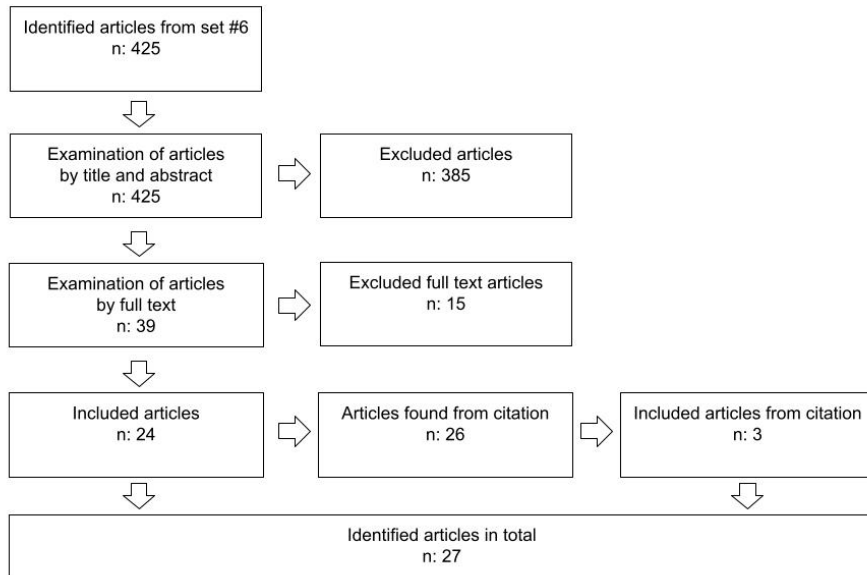
- (1) *What factors contribute to the recruitment of non-career firefighters?*
- (2) *What influences non-career firefighters' decisions to remain in the organisation?*
- (3) *What factors may contribute to resignations among non-career firefighters?*

The authors conducted a literature search using a search strategy with a combination of search words (*see Table 3*) in the Scopus database, which was then supplemented with a review of references, a snowball search, from the articles included.

**Table 3.** Search strings and resulting hits in the Scopus database, 1999-2019/09.

| Set | Search word   | Result       | Date     | Combined search     | Result | Included for full text examination |
|-----|---|--------------|----------|---------------------|--------|------------------------------------|
| # 1 | "firefight*" OR "emergency services" OR "fire service*" OR "rescue service" | 67 442       | 20190917 |                     |        |                                    |
| # 2 | "volunte*" OR "rural" OR "retained" OR "part time"                          | 606 896      | 20190917 |                     |        |                                    |
| # 3 | "recruit*" OR "retention" OR "values" OR "motiv*" OR "abse*" OR "commit"    | 6 445<br>798 | 20190917 |                     |        |                                    |
| # 4 |   |              | 20190917 | #1 AND #2           | 2 199  |                                    |
| # 5 |   |              | 20190917 | #1 AND #3           | 10 552 |                                    |
| # 6 |   |              | 20190917 | #1 AND #2<br>AND #3 | 425    | <b>39</b>                          |

The search involved four steps: (1) Search with keywords and combinations in the Scopus database; (2) Exclude articles based on title and abstract and by using inclusion and exclusion criteria; (3) Exclude articles based on full-text examination by using inclusion and exclusion criteria and by their purpose, aim and research questions; and (4) Review references in the full-text articles included, a snowball search, from the title and abstract using the procedure described. *See Figure 3.*



**Figure 3.** Illustration of search strategy (updated version from Paper I).

Articles were selected by using exclusion and inclusion criteria. The study included peer-reviewed literature about all firefighters who are not career firefighters in relation to the study's aim. These non-career firefighters were viewed as equal in terms of their ability to join or to resign. The study excluded articles from before 1999, articles about the macro-economic value of volunteering, articles about organising emergency and rescue services (outsourcing, etc.) and articles about firefighters and their exposure, both short and long term, to physical risks and hazards resulting in health issues (such as cancer, post-traumatic stress). See Table 8 for the reasons behind these choices. A total of 27 peer-reviewed articles were finally included. The majority of the articles (17 out of 27) used surveys as the data source but there were also articles using interviews, document analysis, case studies, observational data or a combination. Further, the majority of articles included (21 out of 27) came from Australia or the USA.

### 2.2.2 Paper II - Interviews

Interviewing is a method to obtain information and an understanding of peoples' experiences and perceptions of their reality (Säfstens & Gustafsson, 2020). Most qualitative research operates from the perspective that knowledge is contextual, and therefore the job of the interview is to ensure relevant contexts are brought into focus. According to this perspective, meanings and understandings are created in an interaction (Mason, 2018). Data collection is influenced by the level of knowledge,

biases, experiences and perspectives of the researchers, but also by the participants' willingness and ability to provide information (Downe-Wamboldt, 1992). In Paper II, data was collected using semi-structured in-depth interviews in order to describe the experiences of working as a paid PTF in rural Sweden. In total, eighteen interviews were conducted during autumn 2021. Table 4 show the socio-demographic characteristics of the participants. Interviews were held in Swedish, and after transcription and analysis, the findings were translated into English.

**Table 4.** Socio-demographic characteristics of study participants (updated version).

| Characteristics  | Numbers |
|--|---------|
| Sex  |         |
| Female   | 5       |
| Male   | 13      |
| Age (years)  |         |
| 20-30  | 3       |
| 31-45  | 9       |
| >45  | 6       |
| Family status  |         |
| Partner and no children  | 4       |
| Partner and children   | 12      |
| Single without children  | 1       |
| Single with children   | 1       |
| Principal occupation   |         |
| Student  | 1       |
| Self-employed  | 2       |
| Employed in private sector   | 9       |
| Employed in public sector  | 5       |
| Retired  | 1       |
| Employment time in FRS (years)                                       |         |
| <5   | 7       |
| 5-15   | 8       |
| >15  | 3       |
| Position   |         |
| Firefighter  | 11      |
| Commander (or combined with firefighter)                             | 7       |
| Required time from call-out to departure from fire station (minutes) |         |
| Within 5   | 12      |
| Within 6-8   | 6       |
| Fire crew composition  |         |
| 1 Commander and minimum 4 firefighters*                              | 12      |
| 1 Commander and maximum 3 firefighters                               | 4       |
| 0 Commander and maximum 4 firefighters                               | 2       |

\*1 Fire officer and 4 firefighters is the minimum permitted crew for performing a breathing apparatus intervention.

The Swedish FRSs are diverse in terms of their organisation and management. Some municipalities run their own FRS, while others collaborate with neighbouring municipalities by either having a joint service or having a joint political board. FRSs with different organisational structures and sizes and with a geographical spread were selected and discussed among the authors in order to provide breadth and diverse profiles. The FRSs were selected with a geographical spread representing the southern, central and northern parts of Sweden and with different types of organisations. FRS managers were contacted first and, after obtaining informed consent to interview employees, they forwarded the contact details of PTFs. In six cases the manager asked all PTF personnel for voluntarily participants and then forwarded their contact details. In the other cases, a list of firefighters was forwarded. The list of contact information varied from 3 to 13 individuals. The author picked one to contact but aimed to select both males and females. Then participants were contacted and received information about the study both verbally and in writing. After obtaining informed consent from them, interviews were conducted over a period of two months.

The interviews lasted between 45 and 80 minutes with an average of 57 minutes. Interviews were conducted using the Zoom video conferencing service followed by verbatim transcription of the audio file. The interviews focused on the participants' experiences of being a PTF. The interview started with demographic questions followed by a warm-up question about why and how they became a PTF. Participants were then asked about their experiences, for example "describe your experience of being a part-time firefighter". The questions allowed for some standardisation in the interview process, while also allowing participants to provide in-depth responses about their experiences. Probing and checking were used to provide better-developed, richer, more detailed answers and to promote dialogue, for example "could you elaborate on that?" or "explain what you mean by that". In order to give the participants the opportunity to have a final say, the interview ended with a summary followed by the question "Is there anything we haven't talked about that you would like to add?"

## 2.3 Data analysis

The data analysis in the two papers appended is described in this section.

### 2.3.1 Paper I – Literature review

In Paper I, the articles included were systematically reviewed in relation to the paper's three research questions. The initial step was to read through the articles several times and then systematically sort them into different levels depending on

what issue was addressed. Several articles addressed various perspectives, whereas the total number in Figure 4 exceeds 27. The next step was to identify similarities and recurrent aspects to compile the articles' findings in relation to the study's research questions.

|                     |    |    |   |
|---------------------|----|----|---|
| <b>Societal</b>     | 1  | 3  | 4 |
| <b>Organization</b> | 6  | 18 | 6 |
| <b>Group</b>        | 3  | 6  | 2 |
| <b>Individual</b>   | 10 | 7  | 8 |

**Recruitment**  
 Factors contributing to recruitment

**Retention**  
 Factors influencing decisions to remain

**Resignation**  
 Factors contributing to resignation

**Figure 4.** The figure illustrates the distribution of levels for each topic (research question).

The findings were divided into four levels: individual, group, organisation and societal (see Table 5 for the researcher's definition of each level). The majority of papers included addressed retention at an organisational level and recruitment factors on an individual level. The least mentioned level was societal.

**Table 5.** The author's definition of the four levels.

| Level        | Authors definition  |
|--------------|---|
| Individual   | Factors associated with individual choice, circumstances and personal relationships.        |
| Group        | Mainly how the work group, or other social group contexts, influence a person.              |
| Organisation | Factors associated with management, methods and practice at an organisational level.        |
| Societal     | How factors on a societal level impact decisions. For example through laws or demographics. |

### 2.3.2 Paper II – Qualitative latent content analysis

The data in Paper II was analysed using qualitative latent content analysis according to the procedure by Erlingsson & Brysiewicz (2017). Latent content analysis is a common method and the procedure by Erlingsson & Brysiewicz (2017) is similar to others (Graneheim & Lundman, 2004). The initial step was to read through the text several times. Text responding to the study's purpose was highlighted into meaning units followed by condensation to shorten them down without losing content. See Table 6.

**Table 6.** Example of analysis leading to higher levels of abstraction.

| Meaning unit  | Condensed meaning unit  | Code                  | Category        | Theme  | Overarching theme   |
|---|---|-----------------------|-----------------|--|---|
| "Either you should not have a family at all or you should have a partner who is very understanding to make it work."  | Either no family or an under-standing partner to make it work.                                | Support from others   | Need of support | Being on-call requires lifestyle adjustments and support from others | Serving the community while balancing multiple responsibilities |
| "I had very small children at home when I was on call. (...) When the pager went off, I contacted grandma and told the children that dad had to go now. Grandma is coming now." | Small children at home when on call. I contacted grandma and told the children dad had to go. | On call with children |                 |  |   |

Condensed meaning units were labelled with a code describing the content. Codes that were related to each other, either by content or context, were then grouped into categories. Categories described manifest content responding to who, what, when or where. When the categories were established, the analysis process of emerging the latent meaning in relation to the study purpose began. Categories were sorted into themes, a higher level of abstraction, and then an overarching theme, the highest form of abstraction, which is intended to represent the underlying meaning. Themes describe the content of responses to questions as why, how, in what way or through what means. Manifest content means more concrete descriptions and interpretations, whereas latent meaning is a distance from the text meaning a more abstract description and interpretation (Erlingsson & Brysiewicz, 2017). Consequently, the researchers move from the data to a theoretical understanding. In other words, move from the data as concrete and specific to a more general and abstract understanding. A theme is described as a unifying 'golden thread' running through several categories that brings meaning to a topic or experience (Graneheim et al., 2017).

Although the participants describe their view of a matter, researchers analysed the content and raised the analysis to a higher level from a manifest description to a latent meaning via a combination of analysis and pre-understanding (Erlingsson & Brysiewicz, 2017). With the help of their pre-understanding and knowledge, the researchers interpreted latent meaning. All authors discussed the analysis steps, and agreement was found on codes, categories and then latent meaning found in the themes and the overarching theme.

## 2.4 Ethical consideration

Ethical issues that might arise during the research process need to be addressed and taken into account (Creswell & Poth, 2018). The thesis followed the principles of the Declaration of Helsinki (WMA, 2018). Protecting human equality, integrity and independence in all parts of the study is the essence of ethical consideration in



research (Kjellström, 2017). Ethical committee approval was obtained from the Swedish Ethical Review Authority (reg. no. 2021-00563) for Paper II. This was necessary since the research involved people and measures were taken to not violate their privacy. See *Table 7* for ethical issues in different steps of the research process.

All participants in Paper II were informed that participation was voluntary and that they could withdraw their participation at any time without giving any reasons. Furthermore, the participants and their managers gave their written consent prior to the study. The privacy of the participants interviewed was protected by not mentioning names, dates or locations. The audio file and transcribed data are stored on an encrypted server. A risk when interviewing participants about their experiences is that it could provoke difficult memories and/or emotions that could be hard to deal with. The information letter contained contact details to a person within the research group that could mediate contact to a support person outside the research group, in case a need were to arise.

**Table 7.** Ethical issues in the research process, influenced by Creswell and Poth (2018).

| Time in process                         | Ethical issue  | Addressing the issue   |
|---|--|--|
| <b>Prior to the thesis</b>              | Need for ethical approval.   | Ethical committee approval was obtained (reg. no. 2021-00563) for Paper II.  |
|   | Gain local access permission.  | Local managers in the FRSs were informed (Paper II).   |
|   | Negotiate authorship for publication.                                | An author order was decided in the research group.   |
| <b>Beginning to conduct the studies</b> | Disclose the purpose of the study.                                   | Contact the participants and inform them of the purpose of the study (informed consent letter) for Paper II.                         |
|   | Abstain from pressure from participants to sign consent.             | Assure participants that their participation is voluntary and they may withdraw at any time (Paper II).                              |
| <b>Collecting data</b>                  | Respect the study site and minimise interruptions.                   | Let participants choose the time for an interview (Paper II).  |
|   | Avoid deceiving participants.  | Discuss the purpose of the study with participants (Paper II).   |
|   | Respect potential power imbalances.                                  | Avoid leading questions and avoid disclosing sensitive information (Paper II).   |
|   | Store data using appropriate measures.                               | Data was stored on an encrypted server.  |
| <b>Analysing data</b>                   | Avoid siding with participants and disclosing only positive results. | Report multiple perspectives and also contrary findings.   |
|   | Respect the privacy of participants.                                 | Data was processed anonymously.  |
| <b>Reporting data</b>                   | Avoid falsifying data and findings.                                  | Report honestly.   |
|   | Avoid disclosing information that would harm participants.           | Data was processed confidentially so individuals cannot be identified (Paper II).  |
|   | Clear, straightforward communication.                                | Appropriate language was used.   |
| <b>Publishing</b>                       | Share reports with others.   | Publish open access where possible. The participants were also given a website address to keep up with following results (Paper II). |
|   | Tailor the reporting to diverse audiences.                           | Share results with practitioners/websites/conferences.   |
|   | Do not duplicate.  | Do not plagiarize material.  |



## 3. Discussion of methods

This chapter focuses on explaining different quality criteria, followed by a discussion of the methods used in relation to these quality criteria. The aim is not to discuss the research results which can be found in chapter 4.

### 3.1 Quality criteria

Objectivity has been highlighted as a signature of good research, meaning maintaining awareness of existing conditions, documenting the research process and openly presenting possible effects of researchers' own perspectives and how the study was performed in relation to the outcome (Säfsten & Gustafsson, 2020). All research requires validity and reliability. Validity shows the integrity of the research method, in other words, that the researchers observe and measure what they say they are (Mason, 2018). Validity may be separated into two distinct parts, internal and external validity. Internal validity concerns the extent to whether the study actually provides a basis for answering the research aim or whether there are alternative explanations (Säfsten & Gustafsson, 2020). Internal validity is critical when addressing questions concerning causality (Yin, 2018). A sign of high internal validity is if the impact of alternative explanatory variables may be eliminated (Nyquist, 2017). External validity concerns the extent to which the findings are valid (Nyquist, 2017). External validity addresses the ability to make statements regarding the transferability of the findings. It is typically used to make general statements about a population using data from a sample (Säfsten & Gustafsson, 2020). Reliability involves the accuracy of methods and techniques, how accurately they produce data and whether they obtain the same results when the procedure is repeated (Mason, 2018). Reliability may be affected by random errors caused by the measuring instrument, the research object, the study situation or the researcher (Nyquist, 2017). High reliability does not guarantee that what was meant to be measured was actually measured.

Research must be evaluated in relation to the methods used to generate the results. There is a discussion regarding quality criteria in qualitative research, partly because of the absence of consensually agreed criteria for assessing quality (Spencer et al., 2003). Quality criteria used in quantitative research are not always suitable for evaluating the quality of qualitative research, and there are arguments that

qualitative research requires other criteria (Bryman et al., 2008). A suggested alternative is the concept of trustworthiness. Trustworthiness simply poses the question “Can the findings be trusted?” (Korstjens & Moser, 2018). Trustworthiness in qualitative research may be described using four sub-components: credibility, dependability, conformability and transferability (Lincoln & Guba, 1985).

- Credibility resembles what is known as internal validity in quantitative research (Lincoln & Guba, 1985). Credibility refers to reasonability and the extent to which the research approach and findings remain in sync with the original data. In other words, the findings are supported by data so the reader can see how the researchers arrived at the conclusions (Spencer et al., 2003). Credibility is facilitated by prolonged engagement (spending time with participants to gain a better understanding of the context), persistent observation (rereading and revising the material), triangulation (using multiple approaches) and member checks (an opportunity for participants to correct interpretation) (Korstjens & Moser, 2018).
- Confirmability is the degree to which other researchers corroborate the findings. Confirmability concerns the aspect of neutrality and describes the extent to which the findings can be confirmed by other researchers (Korstjens & Moser, 2018). It increases if the analysis process is thoroughly described and if the researcher verifies his or her position during the process.
- Dependability includes the aspect of consistency, whether the analysis process is in line with the accepted standards for the particular design (Korstjens & Moser, 2018). Confirmability and dependability relate to reliability (Säfsten & Gustafsson, 2020).
- Transferability refers to the extent to which the findings apply to other contexts, groups or settings (Lincoln & Guba, 1985; Mårtensson & Fridlund, 2017). Transferability resembles what is known as external validity in quantitative research. Transferability is facilitated by a “thick description of the participants and the research process” and requires the reader to make the transferability judgements (Korstjens & Moser, 2018).

## 3.2 Paper I

It is common to start a research process with a literature review in order to obtain an initial picture of the research field. However, there is also a risk when doing a literature review in the early stages of the research process. Being well aware of the current literature could impose a challenge when analysing qualitative data later on in the research process, since the pre-understanding can direct attention towards that which already is familiar. On the other hand, not having knowledge about current literature could impose a risk of focusing on already well studied questions. Furthermore, a challenge when conducting inductive analysis is to avoid superficial descriptions and general summaries.

The quality of a systematic review relates to the extent to which the study minimises bias and maximises internal and external validity (Kitchenham, 2004). The literature review in this thesis was a systematic review with the intention of having clear and transparent inclusion and exclusion criteria and a detailed search strategy to secure a high reliability. The research strategy was designed to achieve the aim of the study. Table 8 shows the inclusion criteria and the exclusion criteria and why they were applied. Articles included were required to meet all criteria. Articles were excluded if they met one of the exclusion criteria.

**Table 8. Inclusion and exclusion criteria and comments on both.**

|   | Inclusion criteria  | Comments on inclusion criteria   | Exclusion criteria  | Comments on exclusion criteria  |
|---|---|--|---|---|
| 1 | Peer-reviewed articles in English                             | The lead author was unable to read languages other than Swedish and English. The authors included only peer-reviewed articles to set a certain quality standard. | 1 Articles published prior to 1999.   | Since retention challenges and urbanisation have increased in the last 20 years, the authors excluded older articles.   |
| 2 | Abstract consistent with purpose and aim of the current study | The articles' abstract needed to be related to the study's aim.  | 2 Articles about the macro-economic value of volunteering.  | The study's aim was not to evaluate or advocate for a certain way of working as a non-career firefighter from an economic point of view.  |
| 3 | Articles about non-career firefighters                        | All firefighters that were not career firefighters were included.  | 3 Articles about organising emergency and rescue services (outsourcing, etc.).  | The authors narrowed the study to not include how to organise FRSS.   |
| 4 | Articles about recruitment, retention or resignation          | The article needed to address these issues for full review.  | 4 Articles about firefighters and exposure, both short and long term, to physical risks and hazards resulting in health issues such as cancer, post-traumatic stress. | The aim of the study was not to investigate health issues related to working as a firefighter. However, it should be noted that physical risks and hazards related to the work may affect retention and resignation. Articles about health effects were excluded. |

The review included all types of non-career firefighters. However, the most common type of non-career firefighter in the review was volunteer firefighters. One inclusion criterion was to only consider peer-reviewed international articles written in English since the author was unable to read any language other than English and Swedish. However, to obtain a more comprehensive picture, other documents and also non-peer reviewed material could have been included. Consequently, relevant information in other languages may be missing.

The field of healthcare science is large, with over one million articles published every year. Evaluating the quality of studies included in a literature review is consequently a common practice in healthcare science (Rosén, 2017). Paper I did not specifically evaluate the articles included using a quality assessment strategy. However, it applied stringent inclusion and exclusion criteria, with only peer-reviewed articles included. Preferred reporting items for systematic reviews and meta-analyses (PRISMA) is a checklist developed with the aim of helping authors improve the reporting of systematic reviews and meta-analyses. PRISMA is commonly used in health care intervention but may also be useful for critical assessments of systematic reviews in other types of research (Moher et al., 2009). PRISMA weren't used during the writing of paper I. However it was discussed during the writing of the thesis, but not fully implemented. The risk of not using the assessment checklist can affect publication biases and a lack of thoroughness of the conduct of the systematic review.

It may be difficult to determine a cause-effect relationship between factors affecting firefighters' experiences. The factors may instead be confounding variables. These variables may be dependently and independently causing a spurious association and not be causally related. For example, bad leadership may not be a variable causing the firefighters to resign, but a confounder (for example a bad leadership) may cause both a non-permissive culture and resignations. Paper I included articles with different data sources (survey, interview, document analysis) which may, on the other hand, strengthen internal validity since the wider data coverage is reviewed to answer the research questions.

The external validity of Paper I, which addresses the ability to make statements regarding the generalisations of the findings, may be limited. Some settings for the articles included in the review had a low response rate and/or had samples of mostly males and Caucasians from a limited area. This may lead to a low level of external validity for each study. However, Paper I included different types of firefighters from different contexts and countries which may strengthen the external validity. It may not be possible to make statistical generalisations, but Paper I reveals a good picture of the phenomenon studied, for which reason it may have good relevance.

### 3.3 Paper II

In Paper II, data was collected using semi-structured interviews. There are both advantages and disadvantages of using interviews as a method of data collection. The researcher obtains deep, detailed information regarding the phenomena studied with the flexibility to clarify, probe and prompt. However, drawbacks may include “validity” problems owing to the sample having the wrong respondents (Säfsen & Gustavsson, 2020). Accordingly, one challenge when evaluating trustworthiness in a qualitative study relates to the recruitment of the participants. To achieve credibility, it is crucial to find participants who have experience of the phenomenon studied and are willing to speak about it (Graneheim et al., 2017).

The selection of participants, and a clear description of the context, is important for the transferability of the findings. To recruit participants for Paper II, FRS managers were asked to forward contact details for PTFs. This could have affected the results since the manager had the opportunity to influence the selection, for example by only forwarding contact details for motivated individuals. However, in larger organisations, the managers may not know their employees at an individual level. To obtain a variety of experiences, the participants were selected from different FRS organisations with a geographical distribution throughout Sweden. They represent a range of ages (29-62 years), a wide range of job experience from the service (1-43 years) and were from communities of different sizes. They had different types of principal occupations and family constellations. However, in the majority of cases, the family constellation was ‘partner and children’ (12 out of 18). Furthermore, no PTFs from urban areas were included. The experiences of working as a PTF may differ, depending on whether they operate in an urban or rural area. However, PTFs are usually employed in rural settings (MSB, 2021a). PTFs are a homogeneous group regarding sex; the majority are men. The sample contained a higher percentage of females (28%) than the population (8%), which may lead to lower transferability (MSB, 2021c).

There are both advantages and disadvantages of semi-structured interviews. A structured interview may make it easier to investigate a set of fixed questions with fixed response options. However, since Paper II had a broad aim to explore experiences, a semi-structured interview guide was used with the intention of being more open and letting the participants discuss more freely. Paper II included 18 PTFs and they were interviewed with an open approach and with the intention of not steering the respondent in a certain direction. The interview guide had some demographic questions and a small set of rather open questions. The main question was: “Tell me more about your experiences of working as a PTF”. A pilot interview was carried out, transcribed and discussed among the authors in order to test the interview questions in relation to the study’s aim. To ensure a high level of accuracy, the data was transcribed soon after the interviews were conducted. The dependability of the data collected was maintained by using the same interview



guide in all interviews. Furthermore, since the findings of Paper I and Paper II have similarities, the findings support each other and the results may be valid in other contexts.

Another important question when evaluating the trustworthiness of a study concerns the number of participants. In qualitative research, saturation is considered to be the foundation of rigour in determining sample sizes, but there is little guidance on how to use it outside of Grounded Theory (Hennink & Kaiser, 2022). To cover significant variation, there must be enough data since content analysis emphasises multiplicity and variation in content. However, it is not possible to determine a specific number of interviews since the volume of data depend on the aim of the study and the quality of the data (Sandelowski, 1995).

Furthermore, in quantitative studies, power calculations determine which sample size (N) are necessary to show effects of a certain magnitude from an intervention. However, for qualitative interview studies, there is no similar standard for evaluating of sample size. The researcher often just claims that saturation was achieved and that the addition of more participants did not add anything to the analysis, without specifying their understanding of how saturation has been assessed (Malterud et al., 2016). The saturation concept originates from Grounded Theory, in which sample size is considered to be an element of the ongoing analysis, whereas every new observation is compared with previous analysis to identify similarities and differences. Malterud et al. (2016) have instead conceptualised a model developed as a tool outside Grounded Theory to assess sample size by using five items that determine the concept of the ‘information power’ of the sample in different ways. The higher the information power, the lower the N needed. The model may be used to reflect systematically on items with an impact on the information power of a study. This model was not used during the data collection for Paper II. However, during a review seminar, the model was discussed in relation to the study’s data collection. The model works as an outline for a discussion of what to consider systematically when recruiting participants. The following items from the model by Malterud et al. (2016) related to Paper II are discussed below:

**(1) Narrow or broad aim.** A broad study aim requires a larger sample than a narrow aim to attain sufficient information power, owing to its more comprehensive context. The study’s purpose was considered to be broad (implying a larger sample size).

**(2) Dense or sparse sample specificity.** The study’s participants had characteristics that were highly specific to the aim, and belonged to a specified target group, while also exhibiting variation (implying a smaller sample size).

**(3) Level of theoretical background.** The research area is theoretically based on volunteer firefighters, and the researcher has own experience and pre-understanding of the topic (implying a smaller sample size). However,

less research is conducted in relation to PTFs (implying a larger sample size).

**(4) Quality of interview dialogue.** Strong, clear communication between the researcher and the participants requires fewer participants to attain sufficient information power. A good dialogue was established owing to the researcher's pre-understanding, and a pilot interview was tested and reviewed by the researchers (implying a smaller sample size).

**(5) Analysis strategy.** The study had an exploratory analysis strategy (implying a larger sample size).

In addition, in a recent study by Hennink & Kaiser (2022), the authors identified studies that empirically assessed saturation in qualitative research, documented approaches to assessing saturation and identified sample sizes for saturation. They described approaches to assessing saturation that demonstrate saturation could be achieved in a narrow range of interviews (9–17), particularly in studies with relatively homogeneous study populations and narrowly defined objectives. In all tests of saturation with data from in-depth interviews, they found that saturation was reached in under 25 interviews, more specifically between 9 and 17 interviews. Based on the considerations above, the number of 18 participants could be viewed as a suitable appraisal for the study in retrospect with regard to the defined context, the range of participants and the study aim.

The thesis author has an academic background as a fire safety engineer followed by a 2 year education as a firefighter and also 1 year of fire commander training. The author has worked as a practitioner within FRSs the last 10 years as a PTF, a career firefighter and also a fire safety engineer. These conditions have shaped the researcher and consequently, in some way, influenced the thesis. In the group of authors of Paper II, two of five individuals' had experiences from an FRS.

Latent content analysis is a reflective process and does not have a linear progression in the analysis. It is important to evaluate how the sample and data collections correlate with the study's aim. It is a continuous process of coding and categorising followed by returning to the raw data to reflect. In qualitative methodology, it is imperative to attentively maintain awareness of pre-understanding to not influence the analysis. However, it is simultaneously important to utilise the pre-understanding to facilitate a deeper understanding of the data (Erlingsson & Brysiewicz, 2017). Staying aware of pre-understandings is difficult but also important. The authors tried to approach the data with openness and with the expectation of finding new perspectives. Credibility was confirmed by allocating time for data collection and analysis in the research group. The analysis was a continuous process and the authors went back to the data several times to discuss the codes, categories and themes. Agreement between the authors was reached at every step to ensure that the analysis was supported by the data.

To attain dependability and confirmability, the analysis was discussed and reviewed by all authors and the analysis was also confirmed by using direct quotes. All authors agreed on the categories and themes that emerged from the latent meanings. Another common issue with latent content analysis is deciding how to code the condensed meaning units when the unit can be labelled in different ways. When this situation arose, the authors went back to the impressions of the whole (the transcribed interview) and re-read the text to choose codes that are most reasonable and best matched the data. It is valuable to discuss and reflect together within the group of authors to reach consensus on the best way forward in the data analysis. This is sometimes referred to as ‘researcher triangulation’, which is an important component when striving to ensure trustworthiness (Erlingsson & Brysiewicz, 2017).

## 4. Research results and discussion

In this chapter, the results from the individual papers are used in an attempt to respond to the thesis research aim and objectives as an aggregated result. Each of the research objectives is addressed in the following sections, followed by a discussion in section 4.3 and the implications of the results in section 4.4. For the respective objectives, a review of previous studies is first presented from Paper I, followed by the empirical contribution of Paper II. Paper I is a review of other studies and includes different types of non-career firefighters. Paper II is a study conducted in Sweden and includes only paid PTFs. The reader is referred to the papers in the appendix for further details. Furthermore, for more convenient reading, the results are divided into aspects related to an individual level, followed by a wider perspective related to the organisational level, including social and community aspects.

### 4.1 Objective a) - Describing challenges

This section addresses the first objective; *to investigate and describe the challenges of working as a non-career firefighter*.

#### 4.1.1 Review of previous studies (Paper I)

##### *Individual level*

A repeatedly mentioned challenge of working as a non-career firefighter includes achieving a balance with other commitments. Several studies describe the difficulties of balancing work as a non-career firefighter with family life and other work responsibilities (Cowlshaw et al., 2014; Huynh et al., 2013; Batty & Burchielli, 2011; McLennan et al., 2009; Yarnal & Dowler, 2002). Consequently, the time required for service is challenging (Malinen & Mankkinen, 2018; Yoon et al., 2014; McLennan et al., 2009; Yarnal & Dowler, 2002). Time put into working as a non-career firefighter is time taken from other activities. If non-career firefighters do not achieve a balance between different commitments, it can be expected that they are more likely to resign. Malinen & Mankkinen (2018) found a strong relationship between absence from duty and intention to resign. Furthermore,

operational demands, such as on-call time, are associated with higher levels of work-family conflict, which have negative effects on satisfaction (Cowlshaw et al., 2014). Family conflict is thus a challenge and partner or family disapproval may be a barrier to serving as a non-career firefighter (Malinen & Mankkinen, 2018). Furthermore, a study by West & Murphy (2016) found that firefighters felt that FRS managers had low empathy and understanding of their domestic challenges. Poor leadership and brigade climate is a source of dissatisfaction (McLennan et al., 2009).

Examples of other challenges on an individual level are health concerns and anxieties associated with the risks of attending call-outs (McLennan et al., 2009). Since training (to maintain ability and skills) takes up a lot of time, unsatisfactory training may also be a challenge for non-career firefighters (Malinen & Mankkinen, 2018; McLennan et al., 2009). Dissatisfaction with training corresponds to the findings of Yoon et al. (2014), who found that many fire chiefs had training as an area for improvement and also perceived the amount of required training to be a reason for resignation among non-career firefighters.

### *Organisational level*

Perceived challenges of working as a non-career firefighter are also connected to organisational and social factors. McLennan et al. (2009) describe that specific reasons contributing to resignations were factors such as disputes with another member or feeling excluded from brigade activities. Social and cultural norms may stress interaction and the relationships between firefighters (McNamee & Peterson, 2016). Furthermore, interpersonal conflicts with leadership and a negative atmosphere may be barriers to serving (Malinen & Mankkinen, 2018). A poor working climate and negative attitudes are challenging since these factors contribute to dissatisfaction and may lead to resignation (Malinen & Mankkinen, 2018; McLennan et al., 2009). Furthermore, a perceived lack of adequate supervisory and peer support may also provoke an intention to resign (McNamee & Peterson, 2016). Even though the work as a non-career firefighter entails situations involving risks when attending call-outs, negative aspects such as a poor climate, leadership failures and organisational shortcomings are sources of dissatisfaction that outweigh other negative aspects of the work (McLennan et al., 2009). Stereotyping is an organisational factor linked to lower female participation in firefighting (Batty & Burchielli, 2011). One challenge identified by females is that new firefighting vehicles and equipment have increased in size or are set at inappropriate heights, making it difficult for them to perform the job (Batty & Burchielli, 2011).

From a wider perspective, several factors have been suggested as underlying causes contributing to the challenges regarding non-career firefighter retention, mainly related to demographic change and urbanisation (McLennan & Birch, 2005). Small rural communities tend to have declining populations and higher unemployment (Yarnal & Dowler, 2002). People leaving the area may be a single contributing reason for resignation, for example, a firefighter moves away and the geographical

distance to the fire station is too far (Malinen & Mankkinen, 2018; McLennan et al., 2009).

#### 4.1.2 Empirical contribution (Paper II)

##### *Individual level*

Part-time firefighters in Sweden serve on call, which means that they are on standby and must be prepared to immediately leave their current activity to respond to the call. This constant readiness is challenging from several perspectives. For example, being in an emotional state of constant standby may affect the level of stress experienced or the quality of sleep. Another example is that being on call may require backup support if they have children at home or animals to take care of. Hence, being on standby requires planning around the service and consequently affects the family. A PTF's partner may need to take more responsibility since the PTF must be able to leave at any time. Being on call has been described as a burden since it intrudes, for instance, on doing spontaneous activities with friends and family. Not being able to drive children to their activities is another example. Being on call implies limitations to life. PTFs are required to be within a certain range of the fire station and this affects them in numerous ways, from not being able to take the dog for a walk, to needing backup care for children. Furthermore, a PTF may not be able to go to special family occasions or visit a holiday home. Some PTFs even have principal employment outside the area, which implies a need for support from FRS colleagues when serving on call. They need others to take their shifts in order to attend their principal employment on a daily basis. This may be strenuous for both the individual and the collective, since it continuously creates extra shifts to fill in. Even though PTFs support each other on a recurrent basis, they also describe that they feel obliged to do so, even if they don't want to take extra shifts.

*“Nothing gets easier when on call”*

PTFs compare being on call to being locked up or restrained, not being able to leave the area, which can be challenging. This feeling may be reinforced in smaller communities with less range of service. In larger communities, the PTF may not have the same need to leave the area for activities or public service. Another aspect of smaller communities is the risk of attending a call where they know the victims personally. In addition, in sparsely populated areas, the waiting time for backup or an ambulance may be very long, which may also be emotionally burdensome. Some PTFs describe being a firefighter as a lifestyle. It may be difficult to find a balance between service, family, work and other activities but it is also described as a personal choice to become a PTF, something that is self-inflicted.

### *Organisational level*

The working environment may both create and reinforce challenges perceived by the PTFs. Both the cultural and physical working environments have an impact on their experiences and job satisfaction. PTFs describe becoming an outsider if they do not fit in with current norms at the fire station. Consequently, cultural norms affect non-career firefighters' relationships. Females describe the male-dominated workplace as having an impact on their experiences, for example being treated differently as they are in a minority. There are challenges with the physical working environment as well. Exclusion may be evident in the form of facilities; fire stations which do not have female changing rooms, leading to females showering at home, missing out on valuable post-call-out conversations etc.

Small part-time fire stations may find that they are given lower priority than full-time fire stations. Part-time fire stations often inherit older vehicles and equipment, which leads to reduced motivation owing to a feeling of not being valued in the organisation. A lack of a supportive culture may leave PTFs with poor emotional resilience after strenuous call-outs. Even so, an important aspect of the work as a PTF includes attending calls. A low call-out frequency is a challenge as motivation falls. On the contrary, an excessive call-out frequency may also be demanding and time-consuming. Moreover, learning from the experiences of call-outs has been described as important aspects of the work. Building skills and experience is an ongoing process that may be challenging owing to feelings of never being adequately trained or good enough at everything. This may be contradictory since there is often a willingness to learn more, whereas there is also a feeling of shortage of time. Further, PTFs describe time stress when call-outs last for several hours and they miss out on time at their principal employment.

*“If you go away for half a day and then you come back, well that was half a day of your principal employment. When are you going to recoup that?”*

## 4.2 Objective b) – What contributes to commitment

This section addresses the second objective; *to explore what contributes to the commitment of working as a non-career firefighter.*

### 4.2.1 Review of previous studies (Paper I)

#### *Individual level*

A common denominator for non-career firefighters is their commitment to the work and their obligations and efforts to contribute to the local community. Studies show that non-career firefighters who believe in the importance of their service are more likely to be satisfied and stay committed over time (Gazzale, 2019; Henderson & Sowa, 2019). Non-career firefighters with public service motivation and altruistic beliefs often perform more than is required, putting in extra effort (Schmidhuber & Hilgers, 2019). Both younger and older non-career firefighters are highly aligned towards serving the community, but younger firefighters are also more driven to attain personal success (Francis & Jones, 2012). Furthermore, non-career firefighters describe the individual benefits of firefighting such as meeting new people, increased self-confidence, skills development and an escape from domestic roles and responsibilities (Batty & Burchielli, 2011). Altruistic beliefs tend to be more important than financial compensation. Even if non-career firefighters value monetary rewards, it may also have the indirect effect of discouraging prosocial behaviour among those who care about being perceived as altruistic (Gazzale, 2019; West & Murphy, 2016; Carpenter & Myers, 2010).

#### *Organisational level*

Several studies show that non-career firefighters often share a strong sense of belonging and friendship with each other, which also contributes to satisfaction and the intention to remain (Gazzale, 2019; Henderson & Sowa, 2018; Rice & Fallon, 2011; Lee & Olshfski, 2002; Yarnal & Dowler, 2002). Commitment derived from camaraderie and relationships appears to be a strong force for remaining in the service (West & Murphy, 2016).

Leadership that encourages non-career firefighters' identification with the organisation's goals boosts their commitment (Mayr, 2017; Huynh et al., 2014). Supervisor support, recognition and fairness of procedures are related to satisfaction and the intention to remain (Rice & Fallon, 2011; McLennan et al., 2009). Hence, the working climate and leadership are important links to commitment. Non-career firefighters place much more emphasis on an organisation's goals than paid career firefighters, and they also rely more heavily on organisational justice as a motivational basis (Lee & Olshfski, 2002). Non-career firefighters are more likely to remain if they feel valued as learners, are comfortable with the culture and



continue to experience personal motivation (Hughes & Henry, 2003). Since personal development contributes to commitment, firefighters have a greater intention to remain when they perceive that the organisation invests in employee development. Robust, planned training is likely to create an environment in which non-career firefighters feel that they are adequately prepared and have opportunities for development and feedback (Fallon & Rice, 2015; Henderson & Sowa, 2018). FRSs with flexible training strategies and an ability to recognise current skills tend to be less hierarchical and apply a more interactional approach to enforce social norms (Catts & Chamings, 2006). Another factor encouraging commitment is the use of service awards. Fire departments in Australia have award schemes to recognise long service and bravery (McLennan & Bertoldi, 2005). Haddad (2004) suggests the importance of a community-based perspective when improving non-career firefighters' participation in the service. Since non-career firefighters are recruited from the local community, they tend to be representative of local demographic influences. They bring different skill sets from their principal employment which may also affect the culture of the fire station (West & Murphy, 2016).

#### 4.2.2 Empirical contribution (Paper II)

##### *Individual level*

PTFs share a strong feeling of commitment to their community and to contribute to the welfare of others. Individual motivation is also derived from feelings of pride and from a sense of fulfilment. Several PTFs also describe a feeling of satisfaction when contributing to the community and helping others. A considerable part of the commitment shown by PTFs is related to feelings of doing something meaningful and making a difference in people's lives. Feelings of obligations often originate from a sense of responsibility and ambition to contribute to the welfare of the community. The PTFs describe a need to deliver a basic service in order to make rural areas liveable.

*“They [the municipality] have basically closed  
down everything here but, so far, at least someone  
will come when I am in need.”*

Several PTFs also describe their work as exciting, rewarding and stimulating. The adrenaline rush caused by responding to a call is also a fundamental factor contributing to commitment. It is a contrast to ordinary life to rush to a call-out and help people in need. It is rewarding to be able to help others and contribute to a difference in people's lives. An important motivating factor contributing to commitment on an individual level is the opportunity to gain practical skills, new knowledge and personal development. Even if the possibilities for acquiring

practical skills are significant, self-awareness and feelings of personal development are described as even more important. Some PTFs describe that they receive a new perspective in life and grow as human beings. The knowledge gained in the service is often described as useful in civilian life. The PTFs feel more equipped to handle stressful situations and are willing to act when they encounter an accident in private settings.

There are similarities to volunteering and some PTFs describe that they would have done this even without compensation. However, the financial compensation is both viewed as a positive motivational factor and seen by others as too small in relation to the important services they deliver. Nonetheless, the compensation is not regarded as a primary reason for working as a PTF. Even if the level is viewed as fair or not, other factors such as feelings of satisfaction and personal development are more pronounced as factors contributing to commitment.

### *Organisational level*

The work as a PTF entails social relationships and camaraderie, which are essential to commitment. There is often strong cohesion within the work group that is described as vital, and several PTFs describe their work group as an extra family. Furthermore, different individual skills create greater capability as a collective and a variety of ages and personalities contributes to a harmonious culture. PTFs often describe pedagogical and social skills as valued as they work in groups. Camaraderie is an important factor for involvement in the FRS, and the PTFs describe feelings of trust, reliance and support in the group. Accordingly, commitment may be both shared and reinforced by the group members. Social cohesion contributes to continued commitment and commitment contributes to job satisfaction. The working environment also affects commitment. Investments in equipment and vehicles may reinforce feelings of being valued as a part-time fire station and lead to higher motivation. In addition, a permissive culture with continuous feedback and opportunities to grow also reinforces commitment.

Since the PTFs themselves are a part of the local community, the benefits of their service are often very obvious, especially in sparsely populated areas and geographically large municipalities where the response times may be long.

*“We went to a cardiac arrest the other week, with a two-hour drive. And we were closer; the ambulance was another hour behind us.”*

The reward and gratitude from the community are often great and the community members may also reinforce their feelings of pride. There are examples when PTFs have saved someone's life and, a couple of weeks later, get a “thank you” at the local grocery store. PTFs describe it to be emotionally difficult to encounter an acquaintance when attending call-outs. On the other hand, it may also be very

fulfilling to be able to help and also to have a relationship with the victim or personal knowledge about the area.

## 4.3 Discussion of results

Even though there are differences regarding obligations and level of compensations between non-career firefighters, there are similarities regarding challenges and commitment. Being a non-career firefighter, whether as a volunteer or a paid PTF, includes feelings of pride, self-worth and identity. It seems to be important that the nature of the work, procedures and organisational goals align with these feelings in order to sustain an adequate relationship between the non-career firefighter and the organisation.

Non-career firefighters struggle with similar difficulties, including time demands, negative attitudes at the fire station and balancing work and family life. Both papers show that working as a non-career firefighter requires lifestyle adjustments and support from others. Family life is often built around the service and its requirements. Consequently, it is very important for non-career firefighters to have an adequate balance between their work and their families. Since partner and family disapproval may be a reason for resignation, encouraging this work-family balance ought to be vital. Regardless of the type of non-career firefighter, families are an important factor for support and, consequently, commitment. Educating families of newly appointed non-career firefighters could prepare them better for their experiences to come. Activities for family and friends could also have a positive impact and produce greater awareness of the work.

The relationship between the FRS and the non-career firefighters' principal employer is also of importance. PTFs in Sweden need the consent of and support from their principal employer but other types of non-career firefighter also rely to some degree on their principal employer's support to be able to attend call-outs. A perceived challenge among non-career firefighters, at least in Europe, is reluctant principal employers (Elbers, 2019). However, Paper II shows that PTFs also feel that there are positive synergy effects for employers who have firefighters in their organisation in terms of their medical and firefighting skills.

There is multiple levels influence retention on both individual and organisational levels (and even the society level). These levels both interact and have independent impacts. Non-career firefighters' challenges are complex and multileveled and may also vary over time depending on lifestyle circumstances. It is a fluctuating balance between different forces. Challenges may be perceived as less severe if commitment is strong, and some challenges may also be preventable. There is a need to establish the ability to alleviate challenges at different system levels to achieve well-functioning retention of non-career firefighters. It is important to both encourage

firefighters on an individual level and also work on organisational factors such as culture, leadership and bias.

The thesis results show that an area for improving retention among non-career firefighters is training and development. Non-career firefighters spend many hours training and often show great willingness to learn new skills. Personal development and acquiring new skills is an area that contributes to commitment and job satisfaction. However, additional training time may be a challenge and too much training, as well as unsatisfactory training, may be a trigger to resign. It is necessary to achieve a balance between gaining enough skills to deliver efficient service and feeling overwhelmed by too much time taken from other responsibilities. Therefore, it is important that the training is effective and worthwhile for the individual. FRSs could consider improve flexibility in terms of training and evaluate the effectiveness of training. Furthermore, planning and implementing training aimed at developing non-career firefighters and creating tailored training experiences are potentially valuable for commitment.

Elbers (2019) presented a study on the recruitment and retention of on-call volunteer firefighters in Europe, in which experts from fifteen FRSs throughout Europe discussed the issues apparent in their respective countries. The retention de-motivators were related to individual factors such as taking too much time from other activities/family but also to organisational factors related to the content of the work, such as too many training demands, demands of physical readiness or feelings of not being heard or valued properly. Terms of employment (like low pay), a closed culture, increased reluctance among principal employers and few call-outs were also mentioned as de-motivators. These results correspond to the thesis results. Time demands are a challenge for non-career firefighters and being on call is a central demand for PTFs. Creating processes of performance assessment that provide consistent and meaningful feedback for non-career firefighters is crucial both in improving performance and in signalling the worth of individual contribution since being valued and appreciated is important for job satisfaction and retention. A study by Fallon & Rice (2015) indicates that recognition and support are stronger predictors of job satisfaction for volunteers than for paid staff. A culture of feedback and learning may improve both the satisfaction of the non-career firefighters and also their skills. Furthermore, Elbers (2019) found several retention motivators to be related to organisational factors such as being recognised and feeling group spirit, and also altruistic feelings and excitement. This corresponds to the thesis results. Non-career firefighters value the excitement of the work. PTFs describe that gratitude and being valued in the organisation and by the community are important.

Altruistic beliefs have a great impact on commitment among non-career firefighters and these values could be noticed and valued for enhancing satisfaction. Thesis results correspond with implications of a study by Malinen et al (2020) stating that rural volunteers may be more driven to help their communities. The importance of their contributions to the community should be clearly and frequently

communicated to maintain motivation. Altruistic beliefs and social cohesion tend to be a steady baseline for maintaining commitment to the service. The commitment of non-career firefighters may be described as the sum of the forces of job satisfaction, identity, motivation, pressures and drives that influence them to maintain in the service and enhance performance. Strong commitment may reduce the consequences of perceived challenges. Consequently, social and organisational factors have a great impact on non-career firefighters' experiences regardless of their employment context.

The work as a non-career firefighter is characterised by social relations, both relations in the work group and within the organisation, and relations with the community and the people they serve. Therefore, both interpersonal conflicts and cultural norms may add stress to relationships and cause dissatisfaction, leading to resignation. In Sweden, more female career firefighters than male firefighters encounter harassment and discrimination and choose to resign owing to the lack of equality (MSB, 2021b). Further, Malinen et al. (2020) found that social reasons appear an important factor in volunteer retention implying that creating and maintaining a positive fire brigade culture is essential. FRSs could consider improving an inclusive culture and increasing knowledge about biases and norms, educating leaders to manage conflicts and working to improve healthy relationships between employees.

The two papers have contributed to the research field of non-career firefighters, highlighting similarities between different types and describing the complex interaction between challenges and commitments. Non-career firefighters other than volunteer firefighters are underrepresented in the literature and, although Paper II addressed PTFs, there are still more to explore. Nonetheless, since Paper I included a majority of studies concerning volunteer firefighters and Paper II included PTFs, a comparison between them is possible. Even if the firefighter is a volunteer with no compensation or a paid PTF with obligations, both types show several similarities.

## 4.4 Implications of thesis results

The aspiration of the thesis was to take a point of departure in real life challenges and needs, to address relevant issues from a practitioner's point of view; specifically to increase knowledge about the implications of working as a non-career firefighter in order to understand how challenges and commitment contribute to retention. The results strive to be beneficial for practitioners and add more knowledge to the research area. Since different dimensions and perspectives add different information, future research should strive to be conducted in an interdisciplinary manner to expand the overall picture even further.

Providing public service, in this case fire and rescue service, in rural areas is a complex assignment. Urbanisation, an ageing population, decreasing employment opportunities, financial challenges and large distances are some of the challenges that FRSs face. Current challenges may not have a simple or a single solution. The challenges may be addressed from different stances and also in diverse combinations.

Non-career firefighters are an important resource in rural areas. In Sweden, PTFs are the first rescue responders at 30 % of all call-outs (IDA, 2022). Even if most call-outs may be located to urban areas where career firefighters operate, PTFs are still the first unit on the scene at almost one third of all call-outs. Their importance is particularly clearly in remote areas where back up are far away. PTFs may also play an important role in the future from another viewpoint. In addition to the service PTFs deliver, there is the benefit of providing employment opportunities (in a limited way) in areas where unemployment may be increasing. Compared to urban areas, Sweden's rural areas rank better in term of housing market pressures and the environment (OECD, 2017). In a future scenario with higher mortgages and interest rates, rural areas may be more attractive with cheaper houses, leading to a favourable recruitment base for the FRSs. However, even if PTFs are paid, there is reliance on their motivation and commitment to the service regardless of current financial compensation. Employing PTFs in a rural FRS is also beneficial in terms of depopulation. They both live in and contribute to making rural areas liveable.

The results of both Papers I and II may be of value to practitioners. These results contribute to further understanding non-career firefighters' experiences and of important factors in relation to retention. FRSs could use the results when striving to reduce the consequences of perceived challenges and strengthening existing commitment and motivation. However, organisational, legal and cultural differences may dictate the nature of these challenges, as well as the mechanisms in the solutions designed to reduce them. Table 9 is an example of how the results could be used in an FRS organisation.

**Table 9. Examples of how to convert the results into possible strategies.**

| Commitment contributors            | Strengthening commitment  | Challenges                            | Reducing challenges   |
|------------------------------------|---|---------------------------------------|---|
| <p><b>Personal development</b></p> | <p>Since personal development is an important factor contributing to satisfaction and commitment, FRSSs could consider creating a tailored personal development plan and investigate what skills are valued by the individual and create opportunities to achieve them. Training could also include social skills, conflict management and educational skills.</p> <p>Some skills are mandatory but some skills could be optional, to arouse the individuals' interest. Equally important is to offer continuous feedback and follow-up dialogue. Using a mentor for newly appointed firefighters for close follow-up could be of value.</p> <p>FRSSs could facilitate a yearly survey to examine the perceived level of training time and personal development progress.</p>   | <p><b>Unsatisfactory training</b></p> | <p>Dissatisfaction with training is an area for improvement. FRSSs need to take into account both the amount of training time and the content. Some individuals may be more equipped to be instructors for others. Nourish this commitment shown by individuals. Encourage and recognise individuals who contribute to the development of others.</p> <p>Furthermore, continuously evaluate training programmes. Are they efficient to achieve the stated goals? Consider whether flexible training time is possible to ease individuals' time planning with other commitments.</p> <p>Consider whether every individual needs to have the same skills. Or is it possible to divide skills between individuals, groups or fire stations?</p>  |
| <p><b>Social cohesion</b></p>      | <p>Since cohesive groups are an essential part of being a non-career firefighter, FRSSs should consider training group leaders in conflict management and coaching skills. Strive to resolve conflicts and arguments between individuals right away or close to the event.</p> <p>The FRSS could facilitate a forum for social activities to further strengthen the fire station community. Also facilitate activities where possible between fire stations in the neighbouring area to create feelings of unity. Cross-group interaction could also reduce stereotyping between different groups.</p> <p>Another way of strengthening social cohesion is to evaluate and share outcomes after call-outs and training. FRSSs could facilitate designated time for post-action review and allow an environment in which firefighters can talk and show feelings.</p> <p>Another factor to strengthen cohesion could be to make time for discussing and creating shared community values and goals. Cohesive groups ought to be more stable and can focus on development.</p> | <p><b>Family disapproval</b></p>      | <p>Family disapproval is a challenge for non-career firefighters. FRSSs could consider informing potential firefighters' families about the advantages and limitations of the service in the recruitment process. What operational demands are to be expected? Also, consider a continuous dialogue to evaluate how well the firefighter and the firefighter's family cope with the service over time.</p> <p>The FRSSs could also facilitate family days or activities to involve families more. FRSSs could consider implementing a youth fire brigade to involve families and create a recruitment base. Another suggestion would be to offer some benefits to the firefighters' families.</p> <p>Furthermore, if operational demands (such as on-call time) are challenging for the firefighters' work-family balance, consider evaluating a more flexible approach. Is it possible to have another type of on-call schedule or reduce the amount of training during certain periods of time?</p> |
| <p><b>Recognition</b></p>          | <p>Since recognition is important to non-career firefighters, FRSSs could consider implementing service awards. The awards could highlight valued skills such as educational skills, being a mentor and supporting colleagues.</p> <p>FRSSs could consider showing awareness and appreciation on a regular basis. Since part-time fire stations may feel remote from full-time stations in the organisation, managers could benefit from visiting all stations regularly and mixing groups or stations during training.</p> <p>Consider recognition of firefighters' families and principal employers, who support the firefighter on a regular basis.</p>  | <p><b>Stereotyping</b></p>            | <p>Stereotyping is linked to lower female participation. There is also exclusion in the form of no female showers or a non-inclusive culture. FRSSs could invest in appropriate clothing and facilities and promote an inclusive culture. Some FRSSs even avoid separate changing rooms to reduce stereotyping. Local leaders could be educated in biases and work towards encouraging teamwork by treating everyone equally. Stereotyping could also be seen between groups other than between genders.</p> <p>Managers could clearly convey that diversity is valued and create a forum for conversations about the risk of stereotyping. Exposing firefighters to a broader range of perspectives and different cultures.</p>  |

## 5. Conclusions

The overarching aim of this thesis is to increase knowledge about the implications of working as a non-career firefighter in order to understand how challenges and commitment affect retention. The conclusions of the thesis are summarised below.

*The first research objective (a) focused on investigating and describing the challenges of working as a non-career firefighter. The most important conclusions are:*

- Paid part-time firefighters and non-career firefighters with other obligations and levels of compensation face similar challenges.
- The balance between principal work, the service as a firefighter and family life is a recurrent challenge for non-career firefighters.
- The working environment affects non-career firefighters' experiences. It may reinforce other perceived challenges.
- A lack of support is challenging for non-career firefighters.

*The second research objective (b) focused on exploring what contributes to the commitment of working as a non-career firefighter. The most important conclusions are:*

- Paid part-time firefighters and other types of non-career firefighters share similar altruistic beliefs that contribute to continued commitment.
- Social relationships and cohesive groups contribute to commitment among non-career firefighters.
- The support of non-career firefighters' families is important for a long-term commitment.
- A feeling of personal development is an important factor contributing to commitment among non-career firefighters.





## 6. Future research

Although this thesis contributes new information and data that expand the current knowledge regarding non-career firefighters, it also shows that there are knowledge gaps and thus provides recommendations for future research. The results should not be considered final. There is room for the generation of more data and application of additional methods to further verify the various and complex phenomena of non-career firefighters in different contexts and from different angles. A number of suggestions for future research are presented below.

### Principal employer

There could be a greater focus on the principal employers of non-career firefighters and their attitudes towards employing these firefighters. Some non-career firefighters depend on their principal employer's permission to leave work when attending call-outs. Therefore, it is important to further investigate employers' attitudes, difficulties and opportunities and how to strengthen the collaboration between FRSs and principal employers. Since this collaboration is an essential part of employing PTFs in Sweden, there is a growing need to understand how to strengthen this co-use of personnel. There is also a need to investigate principal employers' experiences in both rural and urban contexts since the challenges may differ.

### Working environment

The results show that the working environment has an impact on job satisfaction and commitment. Both the cultural and physical working environments affect non-career firefighters' experiences of the service. Lack of communication, interpersonal conflicts and a non-inclusive culture may work against commitment and contribute to the perceived challenges. Future research could further explore how the working environment affects non-career firefighters.

## Families of non-career firefighters

This thesis shows that the families of non-career firefighters have a great impact in terms of support. The support of non-career firefighters' families is important for a long-term commitment. On the other hand, family disapproval may be a single reason for resignation. Since families play an important role in supporting non-career firefighters, more knowledge could provide insight for FRSs to develop strategies to ensure long-term retention. Future research could investigate families' domestic experiences of having a non-career firefighter in the family and how they can manage those challenges. There is research about families of volunteer firefighters (Cowlshaw et al., 2008), but they are still an under-researched group and less is known about PTFs' families.

## Partially paid firefighters

The majority of non-career firefighters worldwide are volunteer firefighters. However, in some countries, it is more common to have paid non-career firefighters, such as PTFs in Sweden, on-call firefighters in the US or retained firefighters in the UK. Future research could further investigate this context of employment in relation to recruitment, retention and resignation, exploring how compensation affects retention compared to both volunteering and full-time paid firefighters.

## Minority groups

More female firefighters than male in Sweden experience discrimination and choose to resign owing to the lack of equality (MSB, 2021b). Discrimination may occur not only between sexes, but also between different culturally and ethnically groups. The thesis results show stereotyping affect non-career firefighters' experiences. Future studies could investigate further why FRSs remain gender-segregated and how to increase female participation and also minority groups. There is a knowledge gap of why firefighters are still such a homogeneous group.

## Terminology

The definition of concepts is of importance and there is no consensus regarding the terminology for non-career firefighters. Future research could investigate further which types of non-career firefighters exist and the differences between them and suggest which concept to use.

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## Non-career firefighters in rural areas

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The majority of the firefighters in several countries are non-career firefighters (such as volunteer, retained or paid part time firefighters), but recruiting and retaining these firefighters are often challenging. This is troublesome due to the high reliance of them, especially in rural areas. The lack of non-career firefighters, who often are the first-line responders to emergencies, can be a threat to public safety in rural areas. As population distributions and demographics in rural areas change, followed by difficulties to attract and retain non-career firefighters, it is vital to further understand factors contributing to a sustainable staffing situation in Fire and Rescue Services. This thesis provide knowledge about the implications of working as a non-career firefighter in order to further understand how challenges and commitment affect retention.