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Sick leave in the context of individual and work related characteristics - a study of cabin crew in the Norwegian department of Scandinavian Airlines (SAS)

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Preface

This master thesis is developed as a part of the MSc program in Industrial logistic at Molde University College. The study was conducted during the spring of 2011.

During the work with the thesis we obtained an insight into the vast subject of sick leave. The survey conducted gave a good overview of work related factors and characteristics of cabin crew employed in SAS. We therefore first and foremost want to thank cabin crew in the Norwegian department of SAS for answering the survey and for providing meaningful input. We further want to thank the administration in SAS, represented by Maria Strand, Trine Sønsteby, Åse-Lill Madland and Svein Henriksen. This thesis would not have been carried out without their cooperation.

We also want to thank the management in Norsk Kabinforening (NKF), represented by Elisabeth Goffeng, for their cooperation and input during the work with the thesis, and the academic staff at Molde University College for their guidance and knowledge.

Last, but not least, we want to thank our supervisor Nigel Halpern for his support, contribution and motivation. Without him it would have been difficult to initiate and complete this master thesis.

Grete Mogstad and Stein-Christian Andersen

Molde, May 2011

Summary

Title

Sick leave in the context of individual and work related characteristics – a study of cabin crew in the Norwegian department of Scandinavian Airlines (SAS).

Background and purpose

The purpose of this thesis is to unveil reasons for sick leave reported by cabin crew in the Norwegian department of Scandinavian Airlines (SAS). The focus is divided into two major parts, 1) individual and work related characteristics and how these affect the level of sick leave, and 2) work related factors affecting a general work day of cabin crew. The additional focus on work related factors is to support SAS in their work with the scheduling of cabin crew.

The background for this thesis is a master thesis written by Elisabeth Goffeng in 2004 concerning sick leave in an airline. The study concludes that sick leave amongst cabin crew varies as a function of social parameters and work characteristics. She recommends that further research should be performed regarding knowledge of production within an airline. This thesis aims to continue and elaborate her findings. Other sources for literature are provided as background for certain sections within the thesis.

Methodology

To investigate the individual and work related characteristics and factors the authors decided to perform an anonymous questionnaire-based survey distributed to cabin crew working in the Norwegian department of SAS. The questionnaire was developed for this thesis particularly and is based on experience of one of the authors within the field and on interaction with personnel in the company. The authors were able to distribute the questionnaire to the entire subject population due to the use of email. The response rate was 42,26% based on a total population of 1001 available cabin crew. The data generated was analysed by the use of the program Statistical Packages for Social Science (SPSS). The

analysis performed is based on four main tests; 1) Independent sample T-test, 2) Bivariate correlation, 3) One-way ANOVA and 4) Regression analysis.

The questionnaire consists of 1) questions regarding individual and work related characteristics which the respondents have to identify with, 2) questions regarding sick leave, 3) work related factors which the respondent have to rate according to own experience and opinion, and 4) an option to speak their mind.

Results and conclusion

Individual and work related characteristics proved to have a significant connection or a partial connection with the level of sick leave. When analyzed separately, gender, age, position fraction, whether the cabin crew had children in the household or not, means of transport, group of employment, years employed as cabin crew in SAS and position effected sick leave significantly. A partial connection means that the variable had a relationship with one or more of the reasons for sick leave, but not the total sick leave stated. The reasons for sick leave presented are work related injuries, work related fatigue, infections, child's sickness and a category named *Other*.

When individual and work related characteristics was analysed together through a stepwise regression analysis, position fraction, position, commuting and gender was proved to have an impact on the level of sick leave. Position fraction had an impact of the amount of sick leave due to injuries, while position fraction, marital status, children, commuting and position had an impact on the level of sick leave due to fatigue. Children had further an impact on the level of sick leave due to child's sickness, while position and children affected other reasons for sick leave not covered by the survey.

The work related factors were ranked according to whether they had a positive or a negative effect on the work day of cabin crew. The three factors ranked as having the most positive effect was colleagues, fixed group and check out between 09:00 and 17:00. The three factors ranked as the most negative was unpredictable work schedules, check out between 01:00 and 09:00 and variable group.

The comments given by the cabin crew was categorised according to the frequency stated. It was possible to identify three main categories of statements which were negative; work environment, scheduling and management. Negative comments regarding work related factors given in the previous section is not presented since they are already covered. Positive comments given are not presented since the authors first and foremost were able to categorize them according to the factors, and are thereby covered in the section regarding these.

Limitations and further research

The analysis and results of the master thesis will only be valid and valuable for Scandinavian Airlines in Norway. The theoretical procedure, with some modifications, may though be valuable for other operational departments within the SAS Group, and further for organizations with similar production. A natural step for further research will then be to expand the focus and include pilots, ground service personnel and cabin crew in Sweden and Denmark.

The value of the results may further be limited since it only covers a short time span, a time span which includes relatively big changes in the organisation. These changes may have a larger impact on the level of sick leave than assumed. Furthermore, sick leave experienced in the division may be due to reasons that occurred previous to the examined time period. Another issue for further research may be to divide sick leave into short term and long term sick leave, and thereby investigate if there are different reasons for these. Work load and load factor and the impact on sick leave may also be researched further for any correlation.

This thesis does not research all potential reasons for sick leave, but only those connected with individual and work related characteristics. Sick leave is connected with a range of reasons, so the results given in this thesis may only give an explanation of a fraction of the sick leave reported within the organization. The term *Other* have been used throughout the thesis to cover reasons for sick leave outside these work related sick leaves and should be further researched.

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1.0 Introduction

This chapter gives a general introduction to the subject of sick leave and the aim of this thesis which is sick leave amongst cabin crew in the Norwegian department of Scandinavian Airlines. The structure of the study is presented at the end of this chapter to give the reader an overview of the following chapters and their content.

1.1 Background

Sick leave is a widely discussed issue both politically and economically, and it may be difficult to get a complete understanding of the issue and reasons for it. Sick leave is politically interesting since it may be a measure of the health of the present work force, a measure of the current work ethic, an objective when it comes to productivity within public and private sector and a measure for how well the employer and employee adapts to employment (Ørjasæter, 2009; STAMI, 2010a). Sick leave is further economically interesting since it demands large payments from the national insurance (Folketrygden) and from private companies, leading to reduced productivity. The cost of sick leave for public and private sector consist therefore of two parts; the labour cost and the cost of lost productivity. Measures to reduce sick leave therefore have to be compared with the actual cost of sick leave (Hem, 2011). There exists arguably a third direction in addition to the political and economical approach; the humane. This approach takes the individual into account, looking at the impact sick leave has on the person subjected to it.

The reasons for sick leave are diverse and it is difficult to get an overview. One might though divide the reasons into causes related to the individual employee, the company and/or the society (Molander, 2010). Research conducted on the area comes, due to the various reasons, from a variety of disciplines. The variety of disciplines uses further a diversity of approaches, design and methods, complicating possible overviews of the subject (Ose et al., 2006).

The level of sick leave in Norway is further widely discussed. The most common statement is that Norway experiences a high level of sick leave in relation to the

assumptions for the budget of the state and in relation to the goals set in the cooperation agreements (IA-agreements) (Molander, 2010). Individual differences are experienced in different sectors and industries. The reasons for these fluctuations may be connected with individual factors, work characteristics and industry specific factors (Foss and Skyberg, 2008). Some factors may be characteristics regarding the psychosocial environment, the gender composition at the work place and area of operation.

Scandinavian Airlines (SAS) is a large employer in the Scandinavian countries, and the division in Norway has an IA-agreement with the Norwegian government. The level of sick leave in the company is important for SAS due to this agreement, but also because of policies regarding their personnel and economy in general. The Norwegian division have through the past six years experienced a level of sick leave which lies above the level of sick leave in Norway, even though there was a downward trend from 2006 until 2009, presented in section 2.3. The increase in the level of sick leave that occurred in 2009 may be closely linked with the widely discussed credit crunch and the savings programmes implemented by SAS throughout the years, leading to increased productivity. Within SAS in Norway, cabin crew is the group of employees which have the highest level of reported sick leave, having between 3,4 and 3,8 percentage points higher sick leave than pilots and ground staff (Strand, 2011a).

1.2 Aim and objectives of the thesis

This study aims to support SAS in Norway regarding their work with the level of sick leave in the company. The main objectives are to 1) uncover individual and work related characteristics that have a significant impact on the level of reported sick leave, and 2) uncover the opinions of cabin crew towards work related factors. Improved knowledge of the connection between certain work related characteristics and factors and the level of sick leave may support SAS with regards to the execution of daily production.

To asses and uncover the work characteristics and factors the study is focused upon two major parts. The first part is concerned around a set of research questions developed from previous research. This part aims at unveiling personal and work related characteristics and their impact on the level of sick leave. The second part is concerned

around a set of work related factors developed through interaction and experience within the field of aviation. This part aims at unveiling the opinions of cabin crew towards the factors and thereby gives SAS an indication of which factors that affects their employees the most.

This study may be limited when it comes to giving a complete overview of reasons for sick leave. The study is further descriptive, describing the conditions valid for cabin crew employed in SAS in 2010. This means that there is no presentation of how one may operationalize the findings. One of the authors is, to enlighten the reader, employed in SAS as cabin crew.

1.3 Structure of the thesis

The aims and objectives of the study are presented in this introduction, in addition to a brief background of why the study may be appropriate to conduct. The background is explained in depth in the next chapter.

Chapter 2 consist of a historical and economical background about SAS, a description of and statistics about sick leave in general and work related elements affecting cabin crew. The aim is to provide the reader with sufficient information about the reasons for why the study might be interesting and some insight of what elements that effects employees in SAS on a daily basis.

Chapter 3 consists of the research questions and a description of the work related factors investigated during the study. The development of the research questions is additionally presented in this part. This section founds the theoretical basis for the research done during the study.

Chapter 4 gives a description of the methodological assessments done. The search for primary data through interaction with and observation of cabin crew in SAS, and the survey is thoroughly discussed. The section also covers data analysis, ethical issues that arose during the work with the study, and some limitations of the methodology.

Chapter 5 consists of descriptive statistics based on the data gathered from the survey, in addition to a section about the sample and population and the validity of the survey. The section is mainly divided into two; the first part covering the research questions while the second part covering the work related factors. The part covering the research questions are presented according to the presentation of the hypotheses in section 3.

Chapter 6 presents the analysis performed and the results obtained. The chapter is mainly divided into two, as section 5; the first part regards the research questions and the second part the work related factors. A third part is additionally presented regarding comments that cabin crew posted at the end of the survey.

Chapter 7 consists of the main findings of the study, the main implications these findings have for SAS, limitations of the study and recommendations for further research. The implications are presented according to which of the hypotheses that were supported or partially supported.

Tables and figures are presented throughout the thesis. This practice has been conducted in consultation with the supervisor to reduce the amount of appendices and thereby reducing the need for browsing between pages.

2.0 Background

In this chapter the reader will find background information on the history and the economical situation in SAS, in addition to information on sick leave in general and in SAS in particular. A presentation of the level of sick leave in SAS is further given, and the numbers are compared with the airline Norwegian Air Shutle (NAS) and Norway. The terminology used in this thesis is mostly based on industry expressions/terms and will therefore be explained in this chapter to give the reader a better understanding of the thesis.

The aim of this chapter is to provide the reader with sufficient information about the reasons for why the study might be interesting and some insight of what elements that effects employees in SAS on a daily basis.

2.1 SAS - historical and economical background

Scandinavian Airlines (SAS) is the former flag carrier of Norway, Denmark and Sweden, and is the largest airline operating in the Scandinavian market. SAS had 37% of the market share in Norway, based on passenger volume (SAS, 2011a). The airline was founded by Det Danske Luftfartselskab AS (DDL), Det Norske Luftfartselskap AS (DNL) and Svensk Interkontinental Lufttrafik AB (SILA) in 1946. The SAS Consortium was then established in 1951 when AB Aeroptransport (ABA) joined in. The consortium is today the SAS Group. The SAS Group consists of Scandinavian Airlines (SAS), Widerøe Flyveselskap AS (WF), Blue1 and SAS individual holdings (SAS, 2011a). In addition, SAS bought Braathens in 2002, and by 2007 the company was fully integrated with SAS (SAS, 2011b).

The SAS Group has a business concept which states that “through cooperating airlines the SAS Group will offer flexible and value-for-money air travel with a focus on products and services that meet the needs of business travellers in the Nordic region”. Their vision is to be “the obvious choice”, and their objective is to create value for their owners. One of the group’s targets for profitability is an EBT margin (earnings before taxes) of 7% (SAS,

2011a), and their values say that they should be a company characterized by consideration, reliability, value creation and openness (SAS, 2010).

The economy of an airline is closely linked with the general world economy, and any cyclical fluctuations affect the business. The aviation business has encountered several shifts in demand since the business emerged early in the 20th century, but the last decade is of special interest for this thesis. SAS has since 2002, just after experiencing the downward turn after 9/11 in 2001, introduced various savings programmes. The program Turnaround 2005 was launched in 2002 and lasted until 2005, leading to estimated savings of 14 billion SEK. Further, a cost reduction of 4 billion SEK was conducted from 2006 to 2008, while Strategy 2011 (S11) was launched in June 2007. S11 aimed at "achieving full profitability and securing the company's ability to manage the increasing competition" (SAS, 2009a). The widely discussed credit crunch led to a change in market conditions and difficulties in the implementation of S11, paving the way for another programme for savings; Core SAS. This programme was launched in February 2009 and is estimated to save the company 7,8 billion SEK by 2011. The programme is expected to have earnings effects in 2012 as well. According to The Air Transport Association (IATA), reproduced by SAS (2010), 2009 was the toughest year in airline history, giving an estimated aggregated loss of USD 11 billion.

Core SAS consist of five pillars and is estimated to ensure a more effective, profitable and competitive SAS. The pillars are; (1) Focus on Nordic home market, (2) Focus on business travellers and strengthened commercial offering, (3) Improved cost base, (4) Streamlined organization and customer oriented culture, and (5) Strengthened capital structure (SAS, 2011a).

The first pillar involves divesting or outsourcing companies not included in the core operations. This involves holdings in the companies Spanair, Estonian Air, bmi, AeBal, Cubinc Air Cargo, airBaltic, Skyways, Air Greenland, Spirit Air Cargo and Trust. SAS Ground Handling (SGH) and SAS Tech, which are parts of operations, are also sought to be outsourced. The second pillar involves the introduction of a new concept called "Service and Simplicity", aiming to further maximising customer value. Service and simplicity,

according to SAS, involves increased punctuality, flying where the customers actually wants to go, minimizing time of travel, maximizing the customer-experienced value during flight and making it easy to fly. This pillar is said to contribute to the improvement of customer satisfaction and closing unprofitable routes in 2009/2010, especially to leisure destinations. A reduction of 21 aircrafts was carried out due to the reduction in routes, affecting the cost base. This leads to the third pillar which involves cost reductions affecting the whole organisation through, amongst others, the layoff of staff and decreased staff wages and other economic benefits. One of the goals with Core SAS is to reduce the work force by 4600 employees, either through direct layoffs or by divesting certain divisions. By the end of 2010, 600 full time equivalents (FTE's) remains to be fully implemented. The targeted estimated savings of the cost programme of 86% was reached by the end 2010 (SAS, 2011a). The fourth pillar involves streamlining of the organization and improvement of the customer oriented culture, and will be achieved by centralizing and simplifying the different units within the company. An example is that SAS until 2009 flew under three different aircraft operator certificates (AOC's), one for each of the Scandinavian countries. By merging the companies together under one AOC they were able to reduce the total administration of the companies. SAS Tech has further been integrated into Scandinavian Airlines to simplify the technical maintenance. The fifth and last pillar involves a strengthening of the financial preparedness. By doing so SAS believes to be "able to handle unexpected situations and weakened macro-economic development" (SAS, 2011a).

Key economical figures for Scandinavian Airlines in the period 2007 to 2010 are given in table 2.1. SAS accounted for 87,1% of the revenues in the SAS Group and carried 85,3% of the regular passengers to 93 destinations on 667 daily flights. The term regular passenger excludes charter traffic. SAS experienced a decrease in number of passengers from 2008 to 2009 due to reduced demand, but experienced an increase between 2009 and 2010. Due to Core SAS the supply of available seats is better matched with the demand, giving a higher load factor in 2010 than in 2009 and 2008. The revenues were nevertheless reduced, despite the small increase in number of passengers. This may be a result of decreased fares. EBIT stands for earnings before interest and taxes, while EBT is earnings before taxes only. These figures, which is before non-recurring items, shows that

SAS turned operations profitable from 2009 to 2010. But due to large non-recurring items such as a number of legal disputes (991 million SEK) and 5 000 flights cancelled due to closed airspace as a result of a volcano eruption on Iceland, earnings before taxes (EBT) was negative.

SAS - Economical figures	2010	2009	2008	2007
Number of passengers (000)	21 532	21 383	25 355	24 403
Revenue passenger kilometres (RPK)	23 494	23 241	27 890	27 304
Available seat kilometres (ASK)	31 254	32 440	38 776	36 852
Passenger load factor	75,20 %	71,60 %	71,90 %	74,10 %
Revenue (MSEK)*	35 676	39 696	47 536	45 355
Operating expenses (MSEK)*	-32 627	-38 574	-44 672	-39 304
EBIT before non-recurring items (MSEK)*	1 422	-1 094	-18	1 667
EBT before non-recurring items (MSEK)*	806	-1 522	-188	1 270
Non-recurring items	-1 125	-1 766	-606	-1 566
EBT (MSEK)*	-319	-3 288	-794	-296

* Adjusted and including all elements in Core SAS

Table 2.1: Key economical figures for Scandinavian Airlines. Source: SAS (2008, 2009a, 2010, 2011a)

Table 2.2 gives some of the key operating figures for SAS between 2007 and 2010. The average number of employees have been, in accordance with Cores SAS, reduced with 21,7% from 2007 to 2010. The average number of cabin crew have been reduced with 21,3%, while the number of pilots was reduced with 27%. The share of home market, which is the Scandinavian countries, was reduced with 7 percentage points within the time period. Number of destinations was reduced with 23,8% from the peak in 2008 until 2010, while the aircraft fleet was reduced with 19,7%. It is important to notice that the numbers includes aircraft individuals leased out to other companies, not all of them are flown by SAS during the period. The utilization of the aircrafts has also been reduced by 8,5% from the peak in 2008 to 2010. An increase in production by the pilots and cabin crew from 2009 to 2010 is on the other hand visible when looking at block hours per year. Block hours are defined as from when the aircraft moves from its parking for the purpose of taking off, also defined as block off, until it comes to rest on the designated parking position or until all engines are stopped, block on (SAS, 2011c). Block hours per year decreased in from 2008 to 2009 due to decrease in demand and supply. Changes in the company due to Core SAS and an increase of demand have lead to a higher utilization and

productivity of the employees. On average each pilot and cabin crew flew 12,5% and 6% more in 2010 than in 2007, respectively.

SAS – operative figures	2010	2009	2008	2007
Average number of employees	12 883	14 438	16 286	16 448
Average number of Cabin Crew	2 442	2 835	3 049	3 101
Average number of Pilots	1 297	1 609	1 686	1 777
Share of home market	37 %	39 %	43 %	44 %
Number of destinations	93	100	122	107
Number of aircrafts	159	172	181	198
Number of average daily departures	667	707	831	822
Aircraft block hours/day	7,5	8,0	8,2	8,0
Pilot block hours / year	630	550	584	560
Cabin block hours / year	640	616	640	604

Table 2.2: Key operative figures for Scandinavian Airlines. Source: SAS (2008, 2009a, 2010, 2011a)

Table 2.3 gives an overview of the fleet of aircrafts operated by Norwegian cabin crew in SAS in 2010. Boeing 737's was the main type of aircrafts operated in Norway, while the Airbus 330 and 340 was operated on long-haul routes departing from Copenhagen in Denmark. The Fokker 50's operated short domestic routes, but this service was overtaken by Widerøre during 2010. CL stands for Classic, while NG stands for Next Generation and indicates type of technology onboard and the layout of the aircraft. The classic's are viewed as older aircrafts and are originally from Braathens. The certificate needed to operate the five different Boeings' are the same for cabin crew, while additional certificates are needed for the Fokker 50 and the Airbus'. 26,56% of the aircrafts was on average older than 12 years. Number of seats installed gives an indication of how many cabin crew which is needed since the rule is that there shall be one cabin crew member per each 50 or fraction of 50 passengers seats installed on the same deck on an aircraft (SAS, 2011c).

Fleet of aircrafts in 2010				
Aircraft type	Version	Seats	Amount	Average age (years)
Boeing 737-400	CL	150	3	20,3
Boeing 737-500	CL	120	9	17,5
Boeing 737-600	NG	123	9	12
Boeing 737-700	NG	141	17	9,3
Boeing 737-800	NG	180	11	7,9
Airbus 330-300	-	264	4	8,1
Airbus 340-300	-	245	6	9,4
Fokker 50	-	50	5	21,1
Total			**64**	

Table 2.3: Fleet of aircrafts in 2010. Source: SAS (2011a)

2.2 Work related elements affecting cabin crew in SAS

Management in SAS and cabin crew working in the company has a range of different agreements, manuals and regulations that they follow when performing their duties. First of all, the Norwegian and international laws regarding civil aviation has to be followed. One further has to follow Norwegian laws regarding work, agreements between the company and the unions representing cabin crew, and the manuals produced by SAS. The authors will in this part try to present the work load of cabin crew during a normal period of work.

2.2.1 Work characteristics and definitions

Production in an airline refers to the supply of flights, and when a cabin crew produces he or she are working on a flight. One flight may be referred to as a leg, while a series of legs starting and ending at home base is called a route. In SAS, cabin crew may work up to 5-days routes without being home, or they may work five single day routes, being home after work each day. The cabin crew may also work 2-day, 3-day and 4-day routes, depending on their own wish and the demand from the company.

The schedule/roster in SAS shows times for check in and checkout, flights, overnight stays and duration of work, and is released the 16th every month. An example of a schedule/roster for a time period is given in appendix 1. This schedule applies for the following calendar month and shall not be subjected to major changes. The schedule

consists of a series of predefined routes which the crew is assigned to. Cabin crew working in Norway has the opportunity to affect their schedule in some way through a bidding-system (PBS). This system allows the crew to state what is important for them regarding their work situation and thereby weight these against each other. Examples of ways crew may affect their own schedule are where they prefer to have overnight stays, at what time they would like to check in, for how long they are away from home, when they have time of etc. SAS is further implementing a system based on fairness which aims at distributing the routes more fair than previous. This system was not fully integrated during 2010.

Cabin crew working in SAS in Norway has further the opportunity to decide where they would like to be stationed. The options are the airport bases in Oslo (OSL), Trondheim (TRD) and Stavanger (SVG). The crew is responsible to check in at their assigned base before conducting their first flight on duty. Duty is defined by SAS (2011c) to be "the period from when a crew member is required by an operator to commence a duty and ends when the crew member is free from all duties". This means from the time cabin crew checks in at home base until he or she checks out at home base. When conducting flights away from home base during a duty period, SAS is responsible for overnight accommodations and transportation between the airport and the accommodation.

Cabin crew in Norway may also choose between three different fractions of position; 60%, 80% and 100%. Crew is able to seek transfer into one of these fractions after getting a permanent employment. In addition to these positions fractions comes a fourth group called the resource pool. Cabin crew employed in this group works between 28% and 40% and is contracted to work 100% at least one month between May and October which is viewed as the summer season. The resource pool is employed to ensure flexibility when scheduling the production in peak periods. Cabin crew working 60%, 80% or 100% are not allowed to work in this category or seek transfer into this category due to company regulations. Cabin crew working in one of the four position fractions are all permanent employees, but have different contracts.

In addition, cabin crew is divided into Fixed or Variable group, describing the level of predictability of their schedule. Crew employed in the fixed group is scheduled after a permanent key when it comes to work and days off. A key is here defined as the system cabin crew is working after. The key for crew working 100% in the fixed group gives a system based on a combination of 5 days on work and 4 days off (5/4), and 5 days on work and 3 days off (5/3). Crew working 80% are scheduled based on a key giving 4/4 and 4/5 of working days and days off, while crew having the 60% position fraction have a key giving 3/5 and 3/6. Crew employed in the variable group has a minimum number of days off per month and per the two subsequent months instead of a fixed key. Those in the variable group are further divided into two different categories, depending on which agreement they have when it comes to vacations. The type of agreement depends on which union the crew is member of, Norsk Kabinforenig (NKF) or SAS Norge kabinforening (SNK). The first agreement for those working 100% gives a key based on 5/3 and 5/4 with a minimum of 11 days off per month and 22 days of per 2 subsequent months. The second agreement for those working 100% gives a key based on 5/3 and a minimum of 10 days off per month and 22 days off per 2 subsequent months. The number of days off is proportional with the position fraction, so those working 60% and 80% have 40% and 20% more days off respectively (Fosmo, 2011). By January 1st 2010 all crew based in TRD and SVG had to transfer to the variable group to ensure the survival of the bases. The reason for the transfer was the same as the reason for having the two different groups; operational flexibility and economy.

Since SAS has a range of inter-continental routes, a fraction of the crew employed in Norway takes part in this production. This leads to a division between crew operating short-haul only and those operating both long- and short-haul. Short-haul is routes within Europe while long-haul is routes between Europe and other continents. Norwegian cabin crew working long-haul in 2010 was scheduled out from Kastrup, the airport in Copenhagen. Crew flying these routes holds certificates on airplanes from both Airbus and Boeing and may fly a mix of both short- and long-haul routes during a duty period.

Cabin crew employed in SAS in Norway may hold one of three different positions, depending on education, courses and seniority. An Air Purser (AP) is the chief in the cabin

onboard an aircraft and has a range of responsibilities that may differ from those of regular cabin crew. Crew working as AP applied for the position and has been certified for the job. An AP have the position 1R described in appendix 2. Cabin crew having education within food and wine may have the position Air Stewart (AS). Employees working as AS has applied for the position and work or have worked long-haul in a period. They are responsible for the food and beverages onboard the aircraft in addition to taking part in safety and security related duties. The majority of cabin crew has the position Air Host/Hostess (AH). The responsibilities onboard a short-haul aircraft regarding safety and security does not differ from those working as Air Stewarts. Cabin crew working as AH or AS may further be categorized as Senior Cabin Crew (SCC) onboard an aircraft. This means that the crew is the most senior crew in the cabin and has a certification to take the responsibilities of an AP. An AP is therefore not needed onboard every flight.

2.2.2 Standard operating procedures

Standard operating procedures (SOP) is a set of procedures which shall be performed during an operation, and SAS has an own SOP regarding duties of cabin crew during flight. This SOP, including ground and service duties performed by cabin crew, are presented in appendix 2. The SOP and manuals are revised and changed on a regular basis, the presented steps may therefore not be valid for the whole of 2010. Emergency procedures are further not described in the appendix since they do not occur on a regular basis. These procedures are though presented in a paper regarding fatigue written by Nesthus and Schroeder (2007) if further investigation is desired. The alertness demanded due to possible emergency situations is a factor that may affect the crew and their daily work load and should therefore be taken into account. The points presented are gathered from Operation Manual A and B (OM-A and OM-B), which are two of the manuals SAS hold for flight operations, and the service handbook. The steps are given for a regular flight with three cabin crew.

2.2.3 Scheduling

The SOP is given for one flight, but a series of flight may be conducted during a regular work day and further during a duty period. Regulations for this kind of operations are

given in Subpart Q, which is a European law regarding flight and rest periods for flight and cabin crew in the EU. There are additional provisions special for Norway, and additions special for SAS. The additional provisions provide guidelines for, amongst others, daily flight duty and brakes on ground or in the air (Ministry of transport and communication, 2008). Agreements between SAS and the two unions representing cabin crew, NKF and SNK, gives further guidelines for the scheduling of cabin crew in SAS. The basic rules given by the agreement and Subpart Q which applies for cabin crew in SAS are explained below.

The agreement between SAS and the cabin crew facilitates for a maximum production of 900 block hours per year on a 737 aircraft (NKF, 2008). Maximum days of duty per year are set to 188 plus 2 days of courses, while maximum hours of flight duty per month are set to 154. Flight duty is defined as "when the crew member is required by the operator to report for a flight or a series of flights; it finishes at the end of the last flight he/she is an operating crew member" (SAS, 2011c). This means from check in to minimum 15 minutes after block on for the last flight of the day. The maximum production per cabin crew applies for a 100% position fraction, and is reduced for the other position fractions as a quarterly average.

Further, scheduled flight duty hours shall not exceed 42 hours in a rolling 7-days period. These flight duty hours may be exceeded with 6 hours in case of delays or other unplanned events. Maximum daily scheduled flight duty period for a *short* work day may not exceed 10:30 hours of active duty, or 12 hours if the day ends with a passive connection. A short work day involves only domestic routes and international routes which last for less than 3 hours from block off to block on. A passive connection involves flying from one destination to another as a regular passenger. Maximum daily scheduled flight duty period for a *long* day may not exceed 14 hours of active duty, or 15 hours if the day ends with a passive connection. A long work day involves international flights over 3 hours from block off to block on and shall be limited to a maximum of 4 per month and 1 per work block. A work block is defined as the period between two off-duty periods. When working between 22:00 and 06:00, 20 minutes will be added to every

hour, reducing the maximum daily flight duty period. In case of unforeseen circumstances, the daily flight duty period may be exceeded up to 16 hours (NKF, 2008).

A rest period between flights ending and starting at home base shall be at least as long as the preceding duty period or 12 hours, whichever is the greatest. A rest period between flights ending and starting away from home base shall further be as long as the preceding duty period or minimum 10 hours, whichever is greatest. A minimum of 8 hours of sleep shall be provided away from home base, taking travelling and other physiological needs into account. There shall further not be more than 168 hours between the end of a weekly rest period and the start of another. A weekly rest period is a 36-hour period which includes two nights at home base (SAS, 2011c).

2.3 Sick leave in general

Sick leave is defined by Statistics Norway as absence from employment due to sickness (Statistics Norway, 2002). Sick leave is a complex topic that has been in the political debate in Norway for years. The increased focus on sick leave is a consequence of the high spending of the state on insurance (folketrygd) at the expense of other welfare benefits. But the level of sick leave also says something about the workforce and the ability the employers and employees have to adapt to the labour market. For the employers, sick leave results in high costs and lower productivity while for the employees' sick leave can have negative effects such as sleep problems, mental health issues, isolation and reduced opportunity for further careers (Ose et al. 2006).

The arrangement for receiving payment when sick in Norway divides sick leave into short term sick leave, medium term sick leave and long term sick leave. Short term sick leave lasts in general for 1-3 days and is mainly self-certified absence from work. The medium term sick leave generally lasts for 4-16 days while long term lasts from 16 days to one year. Both medium and long term sick leave is physician certified absence. Here, the expense is covered by the Norwegian government's arrangement for payment when sick (Goffeng, 2004).

2.3.1 Reasons for sick leave

The cause for sick leave is influenced by several factors. The state institute of work environment (STAMI) found that the cause for sick leave can be related to the individual, the company and/or the society. The factor that effects the most will depend on the person being affected. Stein Knardahl has developed a model to identify different factors to the three causes of sick leave, presented in a report by STAMI (2010). Within the individual, general state of health is described as a factor. The employee makes an evaluation of her/his own health issues to make a decision whether to be absent from work or not. This evaluation includes their motivation to work, respect towards their co-workers and the company and their personal economy. Within the company, the factors that causes sick leave is described to be situations of downsizing where the consequences for the employees may be longer work hours, the feeling of unfairness, lack of sleep and working shifts. The work itself can also cause sick leave. Lack of variation, control, feedback and whether or not the employee feels that the work task is meaningful may affect the commitment and satisfaction. Further, information concerning a negative economical situation of the company may also be a cause for sick leave. The last factor is the society. The mass media informs about health issues and STAMI states that they have a tendency to dramatize situations by single out stories where the outcome is negative. Both information from the mass media and the health department may affect the employees' evaluation of their ability to work. Other factors within the society which may affect the level of sick leave are education and culture which forms values, norms, expectations and attitude of how a work situation should be (STAMI, 2010).

Five general reasons for sick leave have been identified by the authors through literature and are thereby used throughout this thesis; *Work related injury, Work related fatigue, Infections, Child's sickness* and *Other*. The division of the reasons aims at covering causes for sick leave due the individual, the company and/or the society as described by STAMI (2010) in a tangible way. These reasons focus first and foremost on general issues without going in depth. The reason for this is that the authors want to uncover any possible significant relationship between work characteristics and work load, and sick leave.

The term *Injury* involves every degree of harm that leads to sick leave. When discussing aviation and SAS in particular, this may be injuries experienced by cabin crew in connection with flights or ground duties. Injuries which occurred in SAS in Norway in the period 2008 to 2010 are presented in table A3.1 in appendix 3. The table gives an overview over the number of times the injuries occurred and how many of these that led to sick leave during the period. 28,0% of all reported injuries led to sick leave, and the reasons which affected the number of sick leaves the most were injuries due to turbulence (21,5%), twist of body/body parts (15,4%) and injuries due to hard landings (13,8%). Further, about half of the amount of reported injuries due to turbulence, noise, twist of body/body parts and falls due to slippery surfaces lead to sick leave (Strand, 2011f). Injury is included as a reason for sick leave in this thesis since SAS already has an overview of the causes for injuries and since it is operational for analysis.

Fatigue is defined by Åkerstedt, reproduced by Nesthus and Schroeder (2007), in a report for the Federal Aviation Administration in the US to reflect "the underlying sleepiness/tiredness that results from extended wakefulness, insufficient sleep and circadian desynchrony". Nesthus and Schroeder expands the definition for aviation and define it in terms of the symptoms. The symptoms consists of impaired mood, forgetfulness, reduced vigilance, poor decision making, slow reaction time, poor communication, nodding off, or becoming fixated, apathetic or lethargic. Circadian desynchrony refers to the deviation between regular time of sleep and actual time of sleep, a mismatch that may occur when employees work shifts or have works hours which may be viewed as abnormal. This leads to circadian rhythm which explains a person's daily cycle of sleep and wakefulness. The rhythm is explained by Nesthus and Schroeder (2007) to primarily be "synchronized by local light-dark cycles", but also "by periodic social synchronizers, which include social contacts and activities". The circadian cycle is said to increase sleep tendencies between 02:00 and 07:00, and to a lesser degree between 14:00 and 17:00. Since work in the aviation industry involves flights within these time periods, and since the issue regarding pilots and fatigue was widely discussed during the spring of 2011 (Schmidt, Thomsen, Lund and Hansen, 2011; Higraff, Bastiansen and Jørgensen, 2011), fatigue is included as a reason for sick leave in this thesis.

The term *Infections* involves any kind of virus- and bacterial infections and infections due to fungi and parasites. There is a wide range of possible causes for infections, but common infections within aviation may be the influenza and infections causing problems with the airways or the digestion. Infections as a reason for sick leave are included in this thesis since it is operational for analysis and easily distinguishable.

Child's sickness involves sick leave due to sick children. Law concerning child's sickness states that the employees have the right for 10 days leave every calendar year when necessary to supervise the child. The number of leave days is increased to 15 days if the employee has the responsibility for 2 children. This law applies throughout the calendar year which the child turns 12 years. Should the child have a disability or be chronically ill, the employee has the right to additionally 10 days of leave (SAS, 2011d). Further, the employee has the right to have sick leave if the person who has the daily supervision of the child is sick or is on leave due to child sickness (Arbeidsmiljøloven, 2005). This cause for sick leave is included since it may have a large impact and since it is distinguishable.

The term *Other* deals with any other reason for sick leave not covered by the previous reasons. One reason corresponding with this category may be mental health issues. The authors have chosen to not include mental health issues directly since it may be difficult to operationalize it for analysis, and since it may cross potential ethical borders.

2.3.2 Laws and regulations

All employers and employees in Norway are obliged to follow Norwegian law concerning the work environment and insurance called Lov om arbeidsmiljø, arbeidstid og stillingsvern mv. (Arbeidsmiljøloven) and Lov om folketrygd (Folketrygdloven). The work environment law aims to, amongst other, ensure a work environment that gives a foundation for health, and meaningful work that ensures safety against adverse physical and mental situations. Also, as far as it is possible, the employer must execute measures for employees that have been reduced in its profession due to sickness, accidents or fatigue/wear to continue their work or replace them into different work tasks. The employer has the overall responsibility to register all injuries and sickness that occurs during performance of work tasks and general in the work environment. Further, the

employer must keep statistics on sick leave and absence from work due to children's sickness (Arbeidsmiljøloven, 2005).

2.3.3 IA-company

The Norwegian government and volunteer employers in Norway have signed a letter of intent to ensure a more inclusive work environment. The agreement concerns the term inclusive employment (IA) and aims to reduce the level of sick leave, to help those with reduced work ability into employment and to increase the retirement age.

As a result of the IA-agreement, employers are obligated to follow up employees who are absence from work due to sickness. Within 6 weeks, the employer must have a dialog with the employee to prepare a follow-up plan concerning how the employee can return back to work as soon as possible. Within 8 weeks the employees must have a certificate from a physician stating that there is a significant medical reason that makes them unable to work. Then after 12 weeks, a dialog meeting is arranged between the parties. After 6 months a new dialog meeting is arranged where NAV will be attending. NAV is the labour and welfare administration in Norway and a part of state. The employer and employee are also obligated to meet with the physician or other health personnel if this is considered necessary (Ose, 2010). In the years before the IA-agreement it was nearly unacceptable for employers to initiate contact with an employee on sick leave and ask when they would attend work again. This has changed and it is now common and expected that the employer makes contact. SAS signed the agreement in 2003 (Jønsrud, 2011) and by that the company agreed to focus on preventing injuries, to follow up those who are on sick leave and those who have health issues in order to ensure that employees are included in the active labour force. In practice, management in SAS will follow up their employees and offer a conversation concerning their absence from work. The reason for the conversation is to find any correlation between the sick leave and work related characteristics at the work place and to see if the company can make some measures to prevent further absence (SAS, 2009b). According to SAS, cabin crew has the right to use 24 days of self declared sick leave within 12 months where the period does not exceed 8 days. This only applies when the crew has been working continuously for 2 months or more. Should a cabin crew become ill, he or she have to call in sick to Crew

Control and notify their team manager (SAS, 2011d). The team manager must follow up the crew member accordingly to the laws and regulations in the IA-agreement and the low for work environment (Arbeidsmiljøloven, 2005). SAS have extended these routines by adding the first point in figure 2.1 and have six steps for follow-up their employees.

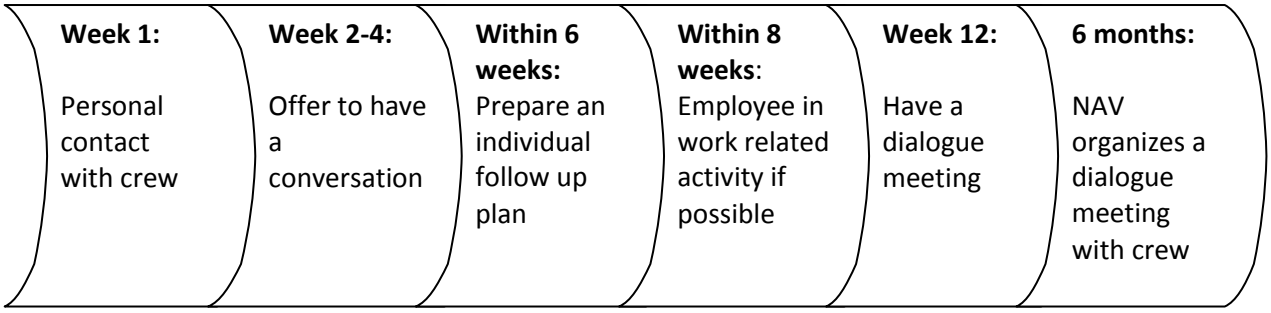

Figure 2.1: SAS' routines for following up on sick leave. Source: SAS (2011e)

Per May 2011 there were 1450 people employed as cabin crew in the Norwegian department in SAS, divided on the three bases. This figure includes cabin crew absent from work due to sick leave or other kinds of leave. There are 7 team managers for all cabin crew per May 2011, meaning that each manager have on average 207 cabin crew that reports to them (Strand, 2011e.)

2.4 Sick leave – statistics

Table A4.1 in appendix 4 and figure 2.2 below presents sick leave for cabin crew in SAS, all staff in SAS in Norway, all staff in Norwegian Air Shuttle (NAS) and the work force in Norway in general for the period 2004 to 2010. On average, the sick leave was 38,7% higher for cabin crew compared with sick leave for total employees in SAS in Norway. This category includes pilots, cabin crew, ground services, sales, planning-execution and general administration such as HR and economics. The average sick leave for cabin crew were further 72,5% higher than the reported sick leave for all staff in NAS. Compared with the sick leave in Norway in general the cabin crew reported to be sick on average 95,8% more often.

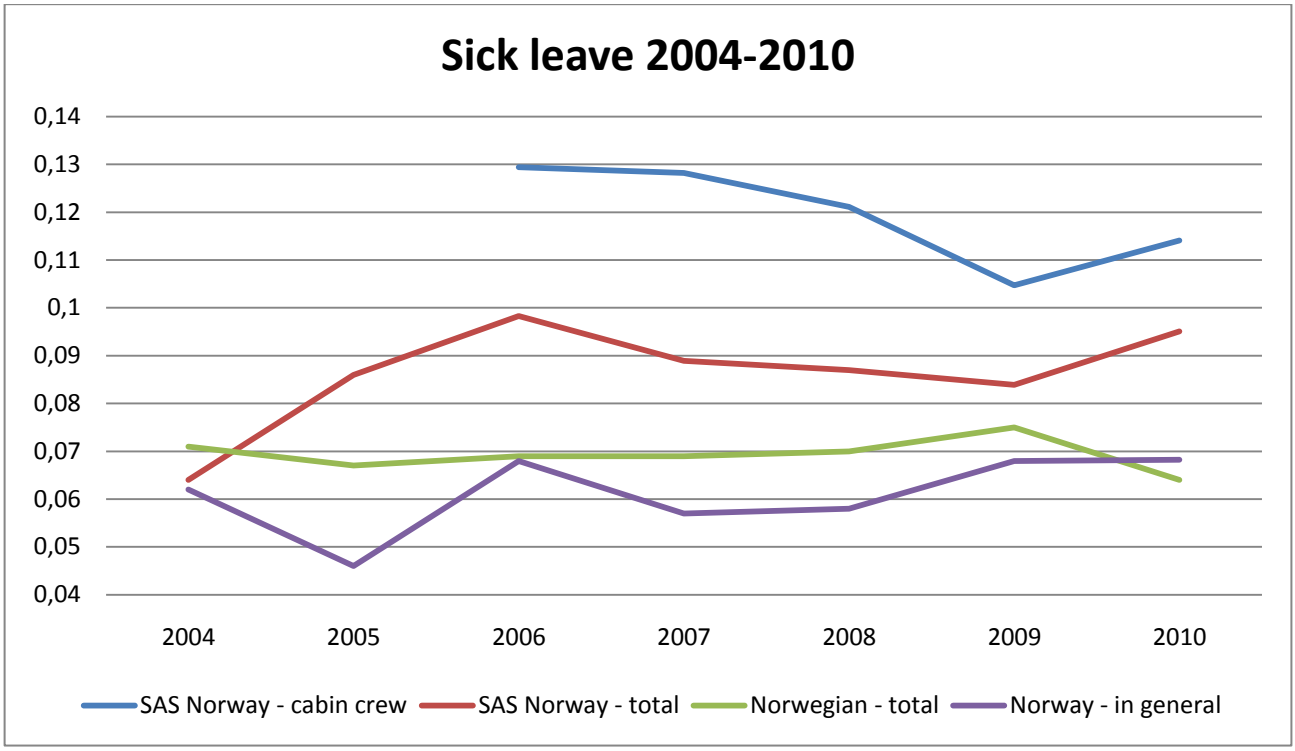

Figure 2.2: Sick leave 2004-2010. Sources: SAS (2005, 2006), Strand (2011a), Norwegian (2005, 2006, 2007, 2008, 2009, 2010, 2011) and Statistics Norway (2010).

Figure 2.3 and table A4.2 in appendix 4 shows the sick leave from 2006-2010 divided by months. One can see that there is a tendency throughout the year, with increased sick leave from February to March, from May to July and from September to November.

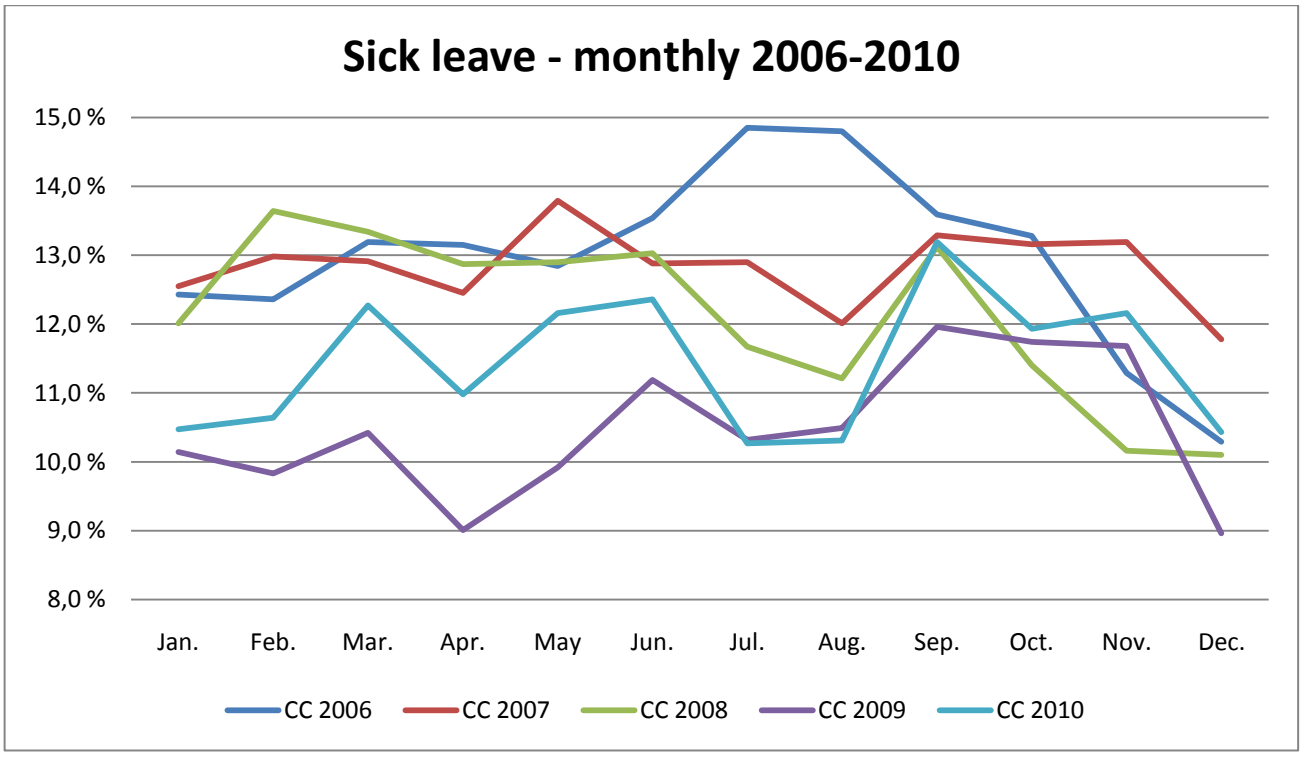

Figure 2.3: Sick leave – Monthly 2006-2010. Source: Strand (2011a)

Figure 2.4 and table A4.3 in appendix 4 shows further the sick leave divided by the three bases during the period 2006-2010. The figures show that cabin crew having OSL as their home base has a higher level of sick leave than those having TRD or SVG.

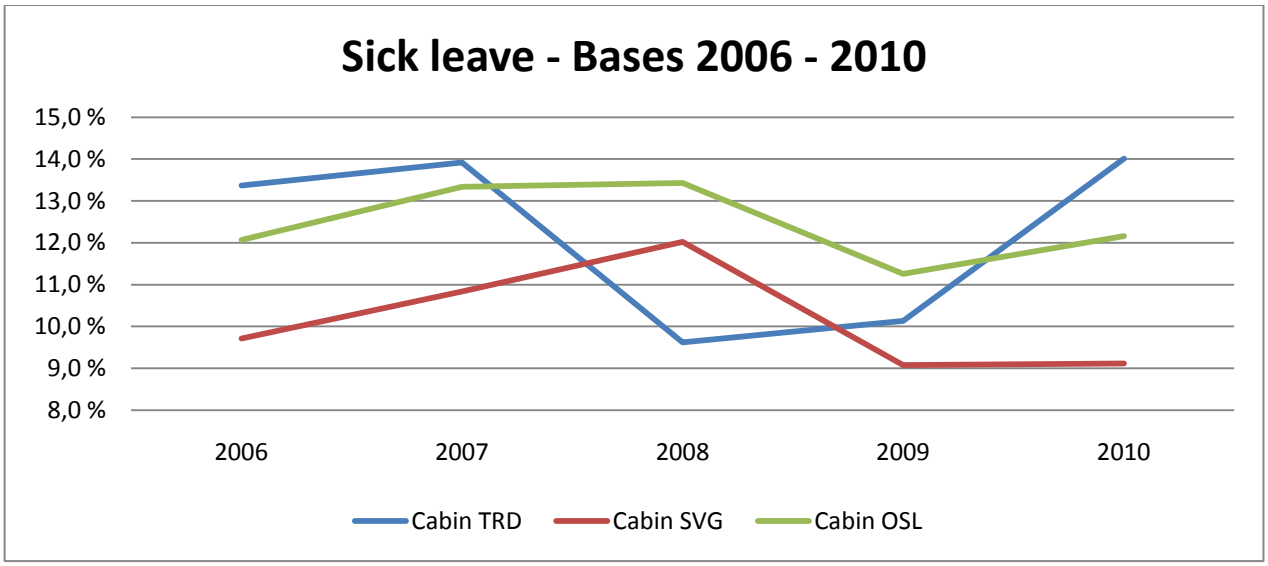

Figure 2.4: Sick leave – Bases 2006 – 2010. Source: Strand (2011a)

Figure 2.5 and table A4.4 in appendix 4 presents the duration of sick leave reported. The numbers is the percentage distribution of sick leave amongst cabin crew in Norway, e.g. 2,21% of the cabin crew reported being sick between 1 and 8 days in 2008. The figure show that sick leave above 16 days accounts for the largest part of the reported sick leave during these years, on average 71,9% of total sick leave. Sick leave between 1 and 8 days accounts for 18,4% of total sick leave, while sick leave between 9 and 16 days accounts for 9,7%. The amount of sick leave below 16 days has been relative stable during the period.

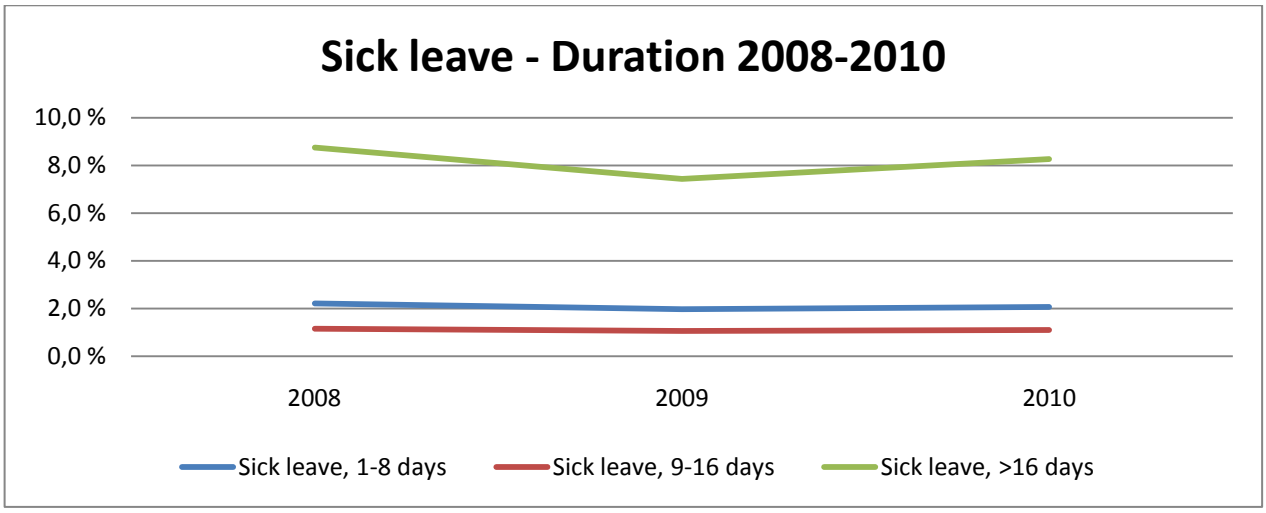

Figure 2.5: Sick leave – SAS 2008-2010. Source: Strand (2011a).

3.0 Research questions and work related factors

A review of literature is presented in this chapter to give the reader a description of what kind of literature the authors found to be relevant to the thesis. The background for the development of the research questions, hypotheses and the work related factors is further presented.

As mentioned in section 2.4, the level of sick leave in SAS is relatively high compared with the level of sick leave in Norway in general. With this information as a point of departure, this study attempts to reveal some of the reasons for the high level of sick leave for cabin crew in the Norwegian department in SAS. More specific, this study 1) investigates if there are any correlations between individual and work related characteristics, and sick leave, and 2) looks at some work related factors and the opinion of cabin crew towards them. The factors concerns mainly the work environments that cabin crew are exposed to.

The first part focuses on general individual characteristics, work related characteristics and sick leave for the previous year. When investigating the level of sick leave, the definition is the total number of times cabin crew called in sick to Crew Control in 2010 and the reasons for sick leave mentioned in section 2.1.1. This means that work related injuries, work related fatigue, infections, child's sickness and the category *Other* also is defined as sick leave. The first section in this part consists of literature-based research questions, while the second section consists of industry-based questions.

The second part focuses on uncovering cabin crews' opinion towards a number of work related factors. The intention is to uncover possible factors that have a more positive or negative impact on a general work day.

3.1 Literature review

In this study, the secondary literature is mainly collected through published articles, books, statistical data, information concerning cabin crew received from SAS, previous

master theses and rapports published by SAS. The literature is collected for the purpose of being background material for the introduction, for development of the research questions, for the development of the questions for the survey and for the analysis of the findings. Relevant articles and statistics that shed a light on individual-, work related characteristics and sick leave were included. By testing previous research against the situation for cabin crew in 2010, this study will, amongst other, investigate if there is any relationship between the conclusions of this study and research done in similar cases.

Articles were mainly retrieved from internet search engines where keywords such as sick leave in context of; cabin crew, children, gender, fatigue and commuting was used as a point of departure. The degree of relevance was determined by reading the preview and the year it was published.

The main source of books covering relevant topics was the library at Molde University College. By using a search engine linked to the library, the researcher could easily separate relevant books from non-relevant books. Statistical data was, amongst others, retrieved from Statistics Norway (SSB) and SAS. Here, statistics regarding employment percentage, sick leave in general and on profession level was found relevant for use in the development of the research questions.

In 2004, Elisabeth Goffeng wrote a master thesis on “Sick leave as a basis for occupational health interventions in an airline”, and concluded that sick leave amongst cabin crew varies as a function of social parameters and work characteristics. She discussed the level of sick leave in Norway and stated that the level varies according to the general world economy and the level of development in the country. Some interesting facts and findings from the thesis is that Norway has a high level of employment, meaning that most of the population is employed. This means that a larger part of the population with disabilities and reduced work capacity is a part of the work force. This will, according to Goffeng, lead to a higher level of sick leave compared with countries that do not include this group of people. Further, she asks whether or not the level of sick leave should be reduced. This is an interesting question and Goffeng argues that not all sick leaves are unwanted. Accepting a certain level of sick leave may act as a safety net for employees

which work over their capacity or is at the risk of being affected by fatigue. Therefore, an acceptance of short term sick leave may prevent long term sick leave. She further discusses the situation of sick leave within cabin crew in an airline company where she found that; 1) males have fewer short term sick leaves than females, 2) AH's have a higher level of short term sick leave compared to AP's and AS's and 3) cabin crew working long haul have a lower level of short term sick leave and sick leaves in general compared to those working short haul. She further found that the level of sick leave increases one week before and after Christmas, one week in May and two weeks in the middle of fall. Further there was an even distribution of short term sick leave throughout the week, while medium term sick leave had a tendency to start on a Monday and end on Sundays. This master thesis was used as a point of departure for this study which goes further when investigating work and individual characteristics which may affect the level of sick leave amongst cabin crew in SAS.

3.2 Research questions

The research questions were developed based on previous studies and interaction with the industry. The industry-based questions were developed by informal interviews of cabin crew and the management in SAS. The aim is to see if the situation for cabin crew deviates from the findings or if it can be supported by published research. The research questions were therefore developed into hypotheses to test them empirically. A hypothesis is an assumption of a fact (Sander, 2004) and will be either supported or rejected on e.g. the confidence level 95% based on the result of the research. To get the most correct analysis of the situation of sick leave for cabin crew, the authors have in addition investigated some general factors concerning their work situation. These are assumptions that are thought to have an impact on their work day and therefore may affect sick leave.

3.2.1 Literature-based research questions

When reviewing the existing literature, several relevant topics concerning work environment and sick leave were discovered. Several researchers and studies claim that women are in general more often sick than men (NAV, 2008, British Medical Journal,

2008). Moore (2001) has summarized the finding of a survey conducted in 2001 from Consumer Healthcare Products Association (CHPA) and shows that in the course of three months prior to the survey, 52% of the women had been sick one or more times, compared to 44% of the men. Further, the survey found that 69% of the women had been to the doctor one or more times for a health problem during the last year, while only 53% of the men had been to the doctor one or more times. To see if the conclusion "women are more often sick than men" can be converted to the situation of cabin crew in 2010, gender in the context of sick leave were investigated.

Research question 1: Does gender affect the level of sick leave?

$H_1$1: Females have a significant higher level of sick leave than males

According to Statistics Norway (2010), employees older than 50 years accounted for a higher percentage of the total sick leave than younger employees in Norway in 2009. This may not be representative within SAS since the age of retirement in the company is lower than Norway in general. The numbers retrieved from Statistics Norway though functioned as a guide since the results was interpreted into the statement that older employees in general have a higher rate of sick leave than younger.

Research question 2: Does age of cabin crew effect the level of sick leave?

$H_1$2: Sick leave reported by cabin crew significantly increases with age

In 2007, Moland conducted a research on the relationship between position fraction and absence from work caused by sickness in the municipality of Oslo, Norway. The purpose of the study was to identify and test tools that could contribute to a reduction of unwanted part-time labour in Oslo. The professions that was studied included healthcare for elderly (both homecare and in nursing homes), cleaning, care for the disabled and after-school activities for children. All professions were female-dominated. He concludes, among other findings, that people with a lower position fraction have less absence from work due to sickness than people with higher position fraction. Moland (2007) defines low position fraction as from 1% to 49%, while higher position fractions is between 50% and 100%. Based on his findings, there is reason to believe that cabin crew with lower

position fractions in SAS (28%-40%) have a lower level of sick leave than those with the higher position fractions (60%, 80% and 100%). To further investigate the research of Moland and to adjust it to the situation in SAS, this study investigated if there is significant difference between the four position fractions and reported sick leave. Both issues are covered by the following research question.

> Research question 3: Does position fraction have an impact on the level of sick leave?
>
> $H_1$3: Cabin crew having a higher position fraction have a significantly higher level of sick leave than cabin crew with a lower position fraction.

Allebeck and Mastekaasa (2004) have reviewed a range of surveys to look for causes of sick leave. Questions regarding children living at home often appeared, but the results varied between the surveys. Some of them showed clear relations, while others showed no connection. Another way of looking at the issue of children living at home and the connection with sick leave may be found by reviewing the article by Viboud et al. (2004). Viboud et al. researched the risk factors of the influenza transmitted in a household and presented three reasons for why children are more likely to be carriers of the virus. First, children have contacts with other children in school or day care. Second, children have a lower immunity which, based on the type of virus, make them more exposed to influenza. Third, "children could (…) be more infectious both because of an increased amount of virus shedding and an increased duration of the infectious period". Based on the findings of Allebeck and Mastekaas and Viboud et al., this study investigated if having children in the household have any impact on the level of sick leave.

> Research question 4: Does cabin crew with children in their household have a higher level of sick leave?
>
> $H_1$4: Cabin crew with children in their household have a significant higher level of sick leave than cabin crew without children in their household.

To further investigate whether characteristics regarding social status have a significant impact on sick leave or not, marital status was included. Allebeck and Mastekaasa (2004)

found through their review of research that marital status often was asked for, but the results of the different surveys were inconclusive. The main reason for this was the use of different alternatives to categorise the respondents. To follow up on the research done the authors of this study investigated if marital status of cabin crew has an impact on sick leave.

Research question 5: Does marital status affect the level of sick leave?

$H_1$5: Marital status significantly affects the level of sick leave.

Commuting to and from work is another factor that can contribute to an increased level of sick leave. According to Koslowsky et al. (1995), commuters are exposed to environmental factors such as noise, crowding, heat/cold and harmful fumes which may lead to physiological stress. In addition there are some psychological factors such as time pressure and disturbing behaviour of other commuters that may affect the wellbeing of a commuter. With these physiological and psychological factors in mind, this study tries to determine if crew using public transport to and from work have a higher level of sick leave than others. Commuting is an expression that contains various definitions, and to make it operational it was necessary to split it into smaller components. The authors tried to investigate if there was a significant difference between the level of sick leave and 1) means of transport, 2) the use of a wide variety of means of transport and 3) estimated time used on commuting. Estimated time of commuting proved to be difficult to measure due to the use of the three different bases, means of transport, speed and distance. This was solved by looking at residence and base together.

Research question 6a: Does means of transport used to travel to and from work have an impact on the level of sick leave?

$H_1$6a: Means of transport have a significant impact on the level of sick leave.

Research question 6b: Does the use of a wide variety of means of transport have an impact on the level of sick leave?

$H_1$6b: The use of a wide variety of means of transport has a significant impact on the level of sick leave.

Research question 6c: Does vicinity to base have an impact on the level of sick leave?

$H_1$6c: Vicinity to base has a significant impact on the level of sick leave.

3.2.2 Industry-based research questions

There are in total five research questions based on interaction with the industry. The methodology regarding the development of these questions is described in 4.2. The first industry-based question aimed to find if there is a relationship between which base a cabin crew is employed at and the sick leave.

Research question 7: Does base have an effect on the level of sick leave?

$H_1$7: Base has a significant effect on the level of sick leave.

As previously explained there are different conditions on the three different bases OSL, SVG and TRD. Crew employed at TRD and SVG are only employed in the variable group while crew at OSL are divided into the variable and fixed groups. The division between fixed and variable group and the impact they have on sick leave were investigated for any differences.

Research question 8: Does group have an effect on the level of sick leave?

$H_1$8: Group has a significant effect on the level of sick leave.

The routes you can operate as a cabin crew in SAS is either short- and long-haul or short-haul only. Since the two possibilities are different, as described in chapter 2.0, there may be a significant difference in the level of sick leave for cabin crew operating these routes.

Research question 9: Does the difference between operating long- and short-haul and short-haul only have an effect on the level of sick leave?

$H_1$9: There is a significant difference in the level of sick leave for cabin crew operating long- and short-haul and short-haul only.

This study investigated further if there is any connection between the number of years a cabin crew have been employed in SAS and the level of sick leave.

> Research question 10: Does the number of years employed as cabin crew in SAS have an effect on the level of sick leave?
> $H_1$10: Number of years employed as cabin crew in SAS has a significant effect on the level of sick leave.

The three available positions Air Purser (AP), Air Stewart (AS) and Air Host/Hostess (AH) have common basic characteristics when it comes to safety, security and service, but there are also some differences, mainly when it comes to responsibilities. This study investigated at last if there is any connection between position and the level of sick leave.

> Research question 11: Does position have an effect on the level of sick leave?
> $H_1$11: Position has a significant effect on the level of sick leave.

3.2.3 Summary of research questions and hypotheses

Table 3.1 represents a summary of the research questions, hypotheses and sources.

Background	Question	Hypothesis	Source
Literature-based	1	$H_1$1	NAV (2008), British Medical Journal (2008), Moore (2001)
	2	$H_1$2	Statistics Norway (2010)
	3	$H_1$3	Moland (2007)
	4	$H_1$4	Allebeck and Mastekaasa (2004), Viboud et al. (2004)
	5	$H_1$5	Allebeck and Mastekaasa (2004)
	6a	$H_1$6a	Kolowski et al. (1995)
	6b	$H_1$6b	Kolowski et al. (1995)
	6c	$H_1$6c	Kolowski et al. (1995)
Industry-based	7	$H_1$7	SAS
	8	$H_1$8	SAS
	9	$H_1$9	SAS
	10	$H_1$10	SAS
	11	$H_1$11	SAS

Table 3.1: Summary of the hypotheses

3.3. Work related factors

In the second part of the research the author's aimed at uncovering the opinion of cabin crew about work related factors. The factors were selected through personal experience as a cabin crew and through informal interviews of cabin crew and the management in SAS. The aim was to map which factors that have an effect and to witch extend they influence a general work day.

The position one might be employed in as cabin crew can vary in forms of position fraction, routes operated (short- or short-long), base and category (AP, AS or AH). With the different combinations and personal characteristics there is reason to believe that crew perceives a general workday differently. By asking them their opinion about different factors the authors were able to better understand some problem areas. SAS may be able to use this information to minimize the negative and enhance the positive variables.

The factors is be divided into six general sections based on their characteristics; check in/checkout, duration of work, routing, traffic schedule, work characteristics and passenger characteristics. The different sections will be discussed below.

3.3.1 Check in / check out

There is an aircraft from SAS in the air at almost any time, 7 days a week, 365 day of the year. It is therefore logic that the cabin crew does not work the generic 08.00 to 16.00 hours like most professions. Check in and checkout time differs according to the routes the crew are scheduled to operate. Therefore, when asking the crew to state their opnions towards check in and checkout time, the authors decided to divide the work day into three sections of eight hours each. The start and end of these time-sections are set to be equal to other services. Cabin crew were presented with three different check-in times; from 00:00 to 08:00, from 08:00 to 16:00 and from 16:00 to 24:00. Likewise, checkout time was divided into three; from 09:00 to 17:00, from 17:00 to 01:00 and from 01:00 to 09:00. The times for check out are a little different from check in times due to the nature of the time schedule in SAS.

3.3.2 Work duration

According to a SAS in-house manual (SAS, 2011c) cabin crew is required a have a break after maximum five hours after the first block off, or no later than six hours after check in. The duration of a break shall last for a minimum of 1 hour and 20 minutes from block on to block off. The length of the brake is due to work done by cabin crew just after block on (disembarkation of passengers) and the work just before block off (safety and security matters and embarkation) (see appendix 2). If the aircraft is delayed the ground stop may be reduced to a minimum of 1 hour and 5 minutes. Further, if the flight is longer than 2 hours 31 minutes the break can be held during the flight. The break shall then start a minimum of 1 hour and 15 minutes after block off. Due to these rules the factors concerning breaks distinguished between breaks less than 3 hours (from 1 hour and 20 minutes up to 3 hours and longer than 3 hours (from 3 hour up to 4 hour and 59 minutes). 4 hours and 59 minutes is chosen due to a regulation regarding maximum length of brakes.

Cabin crew were further asked to rate the number of block hours produced. As mentioned in section 2.1, block time is the time from the air craft leaves the gate to it arrives on the gate at the destination, during this time cabin crew have different tasks to carry out (see appendix 2). The time will vary depending on destination and any experienced delay. The authors believe that flights operated by SAS may be divided into two categories; flights less than 3 hours and flights over 3 hours. Flights less than three hours cover the northern part of Europe, while flights over 3 hours cover the southern part of Europe and other continents. By rating the factors the authors tried to uncover if the rest is sufficient enough. In addition, the number of legs during a workday also was investigated. The crew was further asked to state their opinion towards having few or multiple legs on one workday.

3.3.3 Routing

During a work period, cabin crew can work up to five days, meaning that a work period can vary from a daytrip to a five-day trip. Day trips are days when crew checks in and out at their home base, while two to five-days trip includes overnight stays at various destinations. Between work days the crews are entitled to 12 hours of rest if their final

destination is at home base (OSL, TRD or SVG) and minimum 10 hours at other stations, depending on the amount of work the previous day generated. The crew were asked to state their opinion towards each of the five different trips that may occur within a work period.

3.3.4 Traffic schedule

The fourth section deals with factors concerning general traffic. SAS is an international airline with short- and long-haul flights. Roughly, the traffic can be divided into two groups; scheduled traffic and charter traffic. Scheduled traffic is fixed routes where SAS have the responsibility of the load factor on each route. Charter on the other hand, is when a tour operator has the responsibility of the load factor on the aircraft. Here, SAS only provide the aircraft and crew for rental. In addition to the two different types of traffic and flights, cabin crew were asked to state their opinion towards summer season and winter season.

To refine the factors regarding routes, the researchers divides routs in to tree groups; flights within Norway, flights between Norway and Europe and flights between OSL, CPH and ARN. OSL is the main hub in Norway (Oslo Airport Gardermoen) located outside of Oslo, CPH is the main hub in Denmark (Copenhagen Airport Kastrup) while ARN is the main hub in Sweden (Stockholm Airport Arlanda). Flights between these destinations are often short, but include a wider variety of service onboard than e.g. flights of same length within Norway. Flights between Norway and Europe on the other hand are longer and have a third option when it comes to in-flight service. The kind of service is described in appendix 2.

3.3.5 Work characteristics

The fourth part will focus on work characteristics. As a crew member you are employed either in the fixed or the variable group. The biggest distinction between the groups is that employees in the fixed group know their scheduled work days longer in advance than employees in the variable group. They only have information regarding the days they will work, but not which routs and when. The variable group on the other hand only get this information minimum two weeks and maximum one month in advance. There is

reason to believe that cabin crew that doesn't have a fixed schedule (meaning unpredictable work schedule) is more negative towards this work characteristic.

Further, this study examined the opinions of crew regarding the types of aircrafts they handle. In general, the aircrafts in SAS may be divided into two types; Classic (CL) and Next Generation (NG). CL's are viewed as older aircrafts in SAS and are originally from Braathens. They have a different configuration of the cabin and galleys compared with NG's, and have, amongst others, heavier trolleys. There are different opinions regarding the effect these aircrafts have on cabin crew. Some of the cabin crew are more negative towards working on this type of aircraft compared to NG, while others are more positive. Some of the aircrafts of the type CL are taken over from Braathens during the acquisition, and cabin crew previously working in Braathens may enjoy these planes more than the NG's. Reasons for this may be that they are more familiar to them.

Further, since cabin crew is employed in different position fractions, groups and categories, frequent change of colleagues working together are normal. The crew may change for each route in a work period, regardless of the amount of days they work. This frequent change of colleagues is a result of the flexibility needed for the planning and scheduling department. Therefore, this study asked cabin crew to state their opinion towards often change of colleagues and colleagues in general.

3.3.6 Passenger characteristics

The last section of factors regards the passengers. When an aircraft have a high load factor, it means that all the seats or nearly all the seats are bought and occupied. Therefore, with a high load factor the amount of general work may increase and result in a heavier workload. This may also be the case when there are a high number of passengers flying Business or Economy Extra where the service offered is different from the one in Economy. The nationality of the passengers may also have an effect on the crew. Different cultures behave differently towards time, rules and guidelines, purchase, ethics, norms and values. Therefore, the crew was asked to state their opinion towards high load factor, large business/economy extra, large economy and the nationality of passengers.

4.0 Methodology

This chapter gives a description of the methodological assessments done during the work with the thesis. Here, the authors present the research design, the development and execution of the survey and the ethical issues of the survey. In the end the limitations of the methodology is presented.

The research performed is divided into three parts; interaction and observation, literature review and survey. Interaction with and observation of the test subjects prior to the thesis evolved into a set of beliefs which were developed into the research questions and work related factors. Eight of the research questions are assumptions which are developed from theory, found through a review of existing literature, while five of the questions are developed by interaction with and observation of cabin crew and the management in SAS. The survey is developed around these research questions and factors, and the development of the survey will be the main part of this chapter.

Research design is by many methodological authors divided into two directions, quantitative and qualitative. Quantitative methods are, according to Bryman (2001), often used to test existing theory, while qualitative methods generate theory. Bryman (2001) though explains that it is “necessary to be careful about hammering a wedge between them too deeply”. This master thesis focuses on testing existing theory through the hypotheses, and generate basis for theory through the industry based hypotheses and the factors. During the thesis there was collaboration with the company to obtain both quantitative data and qualitative input, removing the thesis from a strictly quantitative path. For the most part a quantitative approach to the main research was appropriate to get valid and reliable conclusions to the research questions developed through interaction with the industry. A more qualitative approach such as interviews and focus groups may have given a deeper understanding of reasons for sick leave, but the sensitiveness of the research may have limited the outcome.

According to Befring (2007), primary data is defined as data or information that is collected first handed for the purpose of making a background for analysis in research.

Primary data may be collected through observation, interviews and/or surveys. Secondary data on the other hand already exists in one form or another. The source of secondary literature provides an evaluation of previously published research and can be used as background information on a subject. The search for secondary data in this thesis is covered in section 3.1, while the search for primary data in is covered in the sections 4.1 and 4.2.

4.1 Interaction and observation

Some of the research questions developed and the factors that were believed to influence a general work day were found through interaction with the cabin crew, the management and previous experience of one of the authors within the field. A sort of untargeted and unstandardized interview technique was used during the interaction. Berg (2007) describes that the technique starts with the assumption that the interviewer does not know what all the necessary questions are. Further the interviewer has to "develop, adapt and generate questions and follow-up probes to each given situation and the central purpose of the investigation" (Berg, 2007). The unstandardized interviews conducted are in this case more similar to regular conversations amongst crew. Interaction with the crew led not only to verification of obtained beliefs about the work related factors, but also some new ones. Several cabin crew were interviewed by this method during 2010, thereby creating the background for the necessity of the thesis.

During the thesis the authors was also invited to observe a meeting within management. The topic was routes and measurements to reduce the workload impact of cabin crew within the borders of productivity. Through observation of this meeting a greater knowledge of the organization and the aims and goals of the organization was uncovered, as well as what they prioritize. A summary of the interaction with cabin crew and the management in SAS is presented in table 4.1.

Date	Place	With who	Type
Sept. 2010 - Jan. 2011	At work	SAS - Cabin crew	Informal interviews
Nov. 2010 - May 2011	Molde	SAS - management	Emails
November 4. 2010	Gardermoen	SAS - management	Initial planning of thesis
January 28. 2011	Gardermoen	SAS - management	Observation of meeting within management

Table 4.1: Overview of interaction with SAS

4.2 Survey

One of the aims of this thesis is to identify certain variables which may be connected to sick leave within SAS. To handle the hypotheses and create a valid set of data it was decided to base the research on self-completion questionnaires distributed by email instead of other available methods such as interviews, focus groups or regular surveys handled face to face or by postal mail. The advantages of the chosen method is that it is less time consuming, has a low cost due to easy distribution, reduces biasing errors due to zero interaction with the respondent, have greater anonymity, provides considered answers and has greater accessibility (Frankfort-Nachmias and Nachmias, 2008). The method was further the most appropriate since full anonymity was needed and a method which had the lowest cost possible was desirable. Full anonymity was an important factor since the thesis was exploring an area within the private sphere. Reduced anonymity for the respondent may lead to answers which are less accurate, making them hide causes for sick leave that they don't want someone to know. The disadvantages of self-completion questionnaires are generally the requirement for simple questions, no opportunity for probing, no control of who fills out the questionnaire and a historically low response rate (Frankfort-Nachmias and Nachmias, 2008). The authors believe that they were able to circumvent certain drawbacks in some way through the design of the survey.

To compose the questions and to distribute the survey through email, a short evaluation of providers of online service tools was carried through. A company named QuestBack proved to have the most functional tool for this thesis. Another benefit by using QuestBack is that the company also services SAS with means of education of their employees and regular surveys held amongst them. This means that the cabin crew already was familiar with the layout and functionality of the QuestBack survey sent out in connection with the thesis.

QuestBack makes it possible for the respondent to answer the questionnaire directly on the computer, thereby shortening the time of response and the strain put on the respondent compared with questionnaires demanding written answers. QuestBack

further makes it possible to choose between a range of design options and whether a question should be compulsory or not and if it should be single or multiple choice.

4.2.1 Questions

The questions in the survey were based on the research questions and the work related factors. Table 4.2 gives an overview of the independent and dependent variables necessary to answer the research questions.

Hypothesis	**Variables**	
	Independent	Dependent
$H_1$1	Gender	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$2	Age	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$3	Position fraction	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$4	Children in household	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$5	Marital status	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$6a	Means of transport	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$6b	Means of transport (sum)	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$6c	Residence, Base	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$7	Base	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$8	Group	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$9	Routes	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$10	Years employed	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other
$H_1$11	Position	Sick leave, Injury, Fatigue, Infections, Child's sickness, Other

Table 4.2: Independent and dependent variables necessary

Frankfort-Nachmias and Nachmias (2008) lists content, structure, format and sequence as the major considerations involved in formulating questions. They further divide content into factual questions and questions about subjective experience. The structure of questions is divided into open-ended and closed-ended, and further if they are contingency questions or not. When deciding which format a question should have, one may choose between rating questions, matrix questions, ranking questions or questions where you either fill in text or tick a box. The sequence of the questions is the last consideration one has to make, and it is divided into funnel sequence or inverted funnel sequence. A funnel sequence involves starting with broad questions and then narrowing the questions until the end, in a logical sequence. The inverted funnel approach starts out

with narrow questions aiming at establishing facts and ends with wide questions which demand overall judgement.

The survey (presented in appendix 5 and 6) was divided into two major sections; one section covering individual and work related characteristics of the employee and a second section focusing on their opinion. These two sections were further divided into five smaller parts, presented in table 4.3. The first section, which consists of part 1, 2 and 3, was developed to answer the research questions presented in chapter 3.2. The second section, which consists of part 4 and 5, was developed to unveil the opinions of the cabin crew towards the work related factors presented in chapter 3.3.

Part	Description	Number of questions
1	Questions regarding individual characteristics	5
2	Questions regarding work-related characteristics	8
3	Questions regarding sick leave	3
4	Questions meant to measure opinions towards work related factors	4
5	Questions meant to map the hold of certain claims and a open question	4

Table 4.3: Overview of questions

Part 1 through 3 consists of sixteen factual questions, while part 4 and 5 consists of seven questions about subjective experience and one open question. The major part of the questionnaire consists of close-ended questions (21 0f 23 questions) and there are three contingency questions. The questionnaire was further based on an inverted funnel approach.

During the making of the survey it was decided that the major part of the questionnaire should be compulsory, forcing the respondents to answer most of the questions and thereby avoid incomplete surveys and data. Frankfort-Nachmias and Nachmias (2008) present four reasons for why respondents may give less than accurate answers to factual questions: They do not know the information, they cannot recall the information, they do not understand the question or they are reluctant to answer. To circumvent these obstacles and make the data valid, the compulsory questions have the option *Don't know*

and/or *Don't want to answer.* It was believed that the cabin crew had answers to the questions since they was designed to be simple and straightforward. If someone however was uncertain about the answer, it was necessary to let them escape those questions so that they were able to complete the rest of the survey. In some of the questions these options was removed by request from SAS, which meant that it was unnecessary due to the simplicity of the questions (questions regarding work related characteristics). These questions were therefore non-compulsory.

Since most of the questions were viewed as simple, the authors choose to make them close-ended. Frankfort-Nachmias and Nachmias (2008) present close-ended questions as easy to ask, quickly to answer and straightforward to analyse. A major drawback with close-ended questions is that they may introduce bias, either by "forcing the respondent to choose from given alternatives" or by "offering the respondent alternatives that might not have otherwise come to mind" (Frankfort-Nachmias and Nachmias, 2008). The drawbacks were however believed not to occur in the survey since the questions affected only are factual and neutral, asking for descriptive information. Three questions were though open-ended. Common for two of these was that they required the respondent to fill in a number, which was the only allowed format for input in these questions. The last open-ended question was intended to collect any additional information and thoughts that the respondent may hold. The two first open-ended questions were a bit more time consuming to analyse since they need some sorting, but it was believed that it was easier to understand these questions in the present state. The last open question was separated from the rest during the analysis since it demanded a different method for analysing.

Three of the questions in the survey were contingency questions. Two of them were opened to the respondents through a filtering question about whether or not they were sick during 2010. The third was opened to those answering that they had children living within their household.

Four of the seven questions regarding subjective experiences were matrix questions aiming to map the respondent's attitude toward their general work day by asking about their opinion on 34 work related factors. A five point balanced Likert-scale which range

from *Negative* to *Positive* with *No affect* in the middle was used. In addition, a *Don't know / Not relevant* option was added. Decisions regarding these options were important since it was decided to make the questions compulsory.

The discussion on how many points one should have on a rating scale are wide and inconclusive, but Preston and Coleman (1999) have shown through testing of reliability, validity, discriminating power and respondent preferences that scales with two to four point are the least preferable, while scales with seven points and above are the most preferable. Initially, the goal was to use a seven-point rating scale since this would help discriminate the impact of the factors more accurately than a five-point scale, but as Brace (2008) notes, the additional page space required made it difficult to implement the seven-point scale. The layout and design of the survey tool allowed for use of the five-point scale in the questionnaire to make it more esthetical. The use of the five-point scale also made it easier to name each of the points without concerning too much about the small variations between descriptions that one might have had encountered with several points. The variation between *Negative* and *Partially negative* and *No affect* would also be easier to interpret than adding another point within these three.

Friedman and Amoo (1999) have reviewed research regarding whether or not one should include a mid-point on the rating scale, giving the respondent an option to state a neutral answer. This middle option is reasonable to include when the researcher believe that not all respondents have an opinion. The middle point in the survey is however not neutral in the traditional way, but rather an option stating that the respondent doesn't perceive the factor to affect them in either a positive or negative way.

The five-point scale is accompanied with a *Don't know / Not relevant* option since the authors wanted to sift out the respondents that didn't know and those who saw the factor as not relevant. Tull and Hawkins (1993) state that when one believe the respondent to have no opinion about a subject, omitting the *Don't know / Not relevant* option in this case would give less accurate responses. The choice of having the option thereby excluded those without an opinion. One might think that the option *No affect* could be a substitute to the *Don't know / Not relevant* option, but there is a difference

between those without an opinion or those who see the factor as non relevant, and those assessing the factor to have no effect. A factor which is not relevant for a respondent means that the respondent do not experience it, and thereby have no opinion about it. Friedman and Amoo (1999) have further reviewed research on the impact of the *Don't know* option. They state that research show that respondents may have opinions on issues even when they are fictitious. By providing the *Don't know* option one significantly reduces the number of incorrect responses.

The questions in the survey were asked according to theory regarding the inverted funnel sequence approach described by Frankfort-Nachmias and Nachmias (2008). The inverted funnel is described to be a good choice if the purpose is to "obtain a generalization in the form of a judgement regarding a concrete situation". Bordens and Abbott (2008) refers to research done by Dillman (2000) and Moser and Kalton (1972) which states that demographic questions should not be presented first in a survey. They also states that the first question should be interesting, engaging, apply to everyone and easy and quick to answer. The questionnaire in this thesis deviates from these advises since the authors believed it to be easier to answer demographic and work related questions before investigating the broader questions, as with the inverted funnel approach. By starting with these questions, the intention was that the respondent saw that the authors knew about special characteristics related to their work situation, and thereby understood the intention of the study. It was hoped that this approach made them finish the whole questionnaire even if the questions at the end were a little more demanding. By having this approach the authors also felt that the questionnaire had continuity and a logical structure.

Three of the seven subjective experience questions were sentences which the respondent was asked to complete. The main reason for including these questions is that there was some assumptions that the authors would test the hold of. They could have been included into the four previous questions, but the scale did not fit properly. These questions were also viewed as easy and they could end the questionnaire in a good manner, not leaving the respondent after a range of more difficult questions.

Dillman (2000) presented by Bordens and Abbott (2008) also suggests that sensitive questions should be placed after less objectionable questions. Once the respondents are committed to answer your questions they may be willing to answer more sensitive ones. The questions regarding sick leave and reasons for sick leave were viewed by the authors as sensitive, and were therefore placed at the end of the second part of the survey. In the current state they functioned as transition between the general questions in the 1st and 2nd part and the more probing questions in the 4th and 5th part. The first sensitive question leading to the more probing questions about sick leave included the option *Do not wish to answer*. This option was not included in the next two questions since it was not desirable with regards to the design and it was believed to be unnecessary since they accepted the introduction question.

Some of the wording of the questions are quite industry specific. This path was chosen since it is believed that everyone receiving the survey was able to understand them. The words are daily used amongst the cabin crew, and use of them is the only way to explain specifically what the authors seek to investigate. The authors tried further to avoid questions that may be experienced as leading or threatening. The questionnaire concerns the situation for cabin crew in the previous year, making it easier for them to answer the more sensitive question since it happened in the past.

4.2.2 Questionnaire design

QuestBack have a range of design options and during the work with the questionnaire some choices was made, choices that are believed to have had an impact on the degree of response received.

The respondents were allowed to navigate both back and forth in the questionnaire and a progress bar was added to the bottom of each page. Brace (2008) explains that adding progress bars affects how difficult respondents expect the task to be or whether they finish it or not. Due to the layout and order of the questions as described above, the respondents achieved high progress just after a short time span. This may have encouraged them to proceed with the questionnaire without giving up in the middle.

The choice of close-ended questions was a design issue as much as it was an issue of analyse and content. By having the major part of the questions in this format the authors tried to remove some of the strain for the respondent since it reduces the time used to shift between clicking the mouse and writing on the keyboard. Brace (2008) explains that this may maximize the probability of the respondent finishing the survey.

It was chosen not to rotate or randomize the questions since it would disturb the natural sequence of the questions. Rotation or randomization of answer alternatives was neither used since the main part of the questions consists of factual questions with few alternatives. A randomization of the factors which the respondent was asked to rate may beneficially have been rotated, but it was felt that it was more appropriate to follow a predefined and natural sequence.

Finally it was decided to split the questionnaire into several pages (appendix 6). As Brace (2008) explains, this may lead to the respondent finishing the questionnaire quicker than if having all of the questions on the same page. The respondent is thought to be less distracted by the amount of questions, their alternatives and other text. Too many questions on the same page, thereby demanding the respondent to scroll down, may also have led the respondent to skip questions without realizing it. This would have been a problem with both the non-compulsory and the compulsory questions. With the non-compulsory ones they would just skip them without knowing, while forgetting to answer the compulsory will lead to an error message. Too many error messages may tire the respondent and thereby making it easier to close the survey without finishing it. By reducing the time used on the questionnaire the authors also hoped to increase the number of respondents answering the survey.

4.2.3 Subject population

Due to the survey being a questionnaire sent by email to the cabin crew in the Norwegian department of SAS, the authors were able to send it to the total population of about 1400 individuals. This number consists of employee's at all three bases. Some of these were in different kinds of leave during the survey period, reducing the possible answering population to about 1000. Due to the ten minutes cabin crew has to check company

email and other mail at the start of every work block (see appendix 2), it was certain that everyone would notice the email sent out.

4.2.4 Pilot

A pilot is a small-scale experiment where the aim is to test the questions, the method of data gathering and parts of the analysis (Ilstad, Paasche and Hovden, 1982). The test also aims to uncover spelling mistakes and mistakes in the layout and execution. The test should be carried out on individuals with similar characteristics to the subject population. By conducting a pilot, one discovers errors which may have made the conclusions from the survey less valid at the best.

During the work with the questionnaire seven pilots were sent out over a two week period, presented in table 4.4. Each of the tests took approximated two to three days to carry out. Each of the tests led to changes regarding wording of questions, use of scales, design, overall layout and spelling and grammar mistakes. The tests were sent out to four categories of respondents named *Expert, Educated, Management* and *Other*. The *Expert* is a member of staff at Molde University College with specialization within survey design, the *Educated* are acquaintances of the authors with at least a Bachelor degree within economics and/or logistics, *Management* consist of personnel at SAS with experience within aviation and duties of cabin crew, while the category *Other* consists of random picked acquaintances with different background. Except from the management in SAS only two of the respondents were at the time employed and active within the company as cabin crew.

Name of test	Type of respondent	Sent to	Respondents	Response rate
(test:N)(1)	Expert	1	1	100,00%
(test:F)(1)	Educated	10	7	70,00%
(test:F)(2)	Other 1	13	6	46,15%
(test:F)(3)	Other 2	13	7	53,85%
(test:SAS)(1)	Management	3	1	33,33%
(test:SAS/N)(1)	Expert and Management	6	5	83,33%
(test:FINAL)(1)	Management	1	1	100,00%

Table 4.4:Overview of pilots conducted

The category *Other* was divided into two. The reason for this is that it was wanted to test two different ways to ask a question. Two questionnaires were sent out to two different groups, differing only in the design of one question. The feedback to this specific test did not favour any of the versions, so the one which was most consistent with the demand for a straightforward analysis was kept.

4.2.5 Execution

The questionnaire was published through QuestBack, resulting in an URL which was attached to the email sent out. Since the URL was used, the answers were non-traceable. The email was first sent to the Manager of Cabin Safety in SAS for approval before it was sent to the cabin crew by her. Because of certain rights within the email system the authors were not able to send it directly to all the crew by themselves.

The email sent out (appendix 7) aimed to encourage the receiver to answer the questionnaire. The first part of the email is written by SAS since they were responsible for the distribution. The second part of the text was compiled by the authors and it was attempted to hold the amount of text to a minimum, not tiring the respondent before entering the questionnaire. The authors tried at the same time to make it interesting for the crew, linking their general work day with the content of the survey. The fact that it is completely anonymous was mentioned for the first time in the email. The URL was presented in the email and by clicking on the link the respondents came directly to the answer sheet. An introduction at the start of the survey was skipped since it was believed to be unnecessary and time-consuming for the respondent. Another reminder of the total anonymity of the survey was though given by QuestBack at the top of the questionnaire.

The email was signed by the authors and the abbreviation AH was included before the name of one of the authors. The reason for including AH was to show that the survey was not from management, but someone of their own “species”. By doing so the authors tried to establish a bond between the respondent and themselves, aiming on getting more information than one might otherwise have had.

The survey lasted for 34 days and one reminder and two encouragements were sent out through various channels. An overview is given in table 4.3. The reminder was sent through SAS about halfway into the period (appendix 8). According to Bryman (2008), it would have been optimal to send out two reminders, the first after two weeks and the second one a week after the first reminder. SAS though only allowed one reminder due to a wish of minimizing communication sent out to crew from management to strictly necessary messages. The authors tried to avoid the implication of this restriction by cooperating with Norsk Kabinforening (NKF). The first encouragement to participate in the survey was sent through NKF after one day (appendix 9). The encouragement was part of a larger email which is sent to members of the union every Friday. The second encouragement to participate was sent out via NKF towards the end of the period (appendix 10).

Date	Day	Description	Via	Appendix
27.01.2011	Thursday	Questionnaire distributed	SAS	7
28.01.2011	Friday	1st encouragement to participate sent out	NKF	9
14.02.2011	Monday	Reminder to participate sent out	SAS	8
18.02.2011	Friday	2nd encouragement to participate sent out	NKF	10
02.03.2011	Wednesday	Survey stopped		

Table 4.5: Overview of dates

The first invitation to participate in the research was sent out on Thursday. Fridays are usually the day with more communication from the management than other days, so the timing was not optimal. This fact was not realized until the first reminder was due, so it was postponed until Monday, letting the crew go through other relevant mail before they got the reminder.

4.2.6 Reliability and validity

Whether a questionnaire is valid or not is described by Bordens and Abbott (2008) as a question if it measures what it is intended to measure. Validity of the research design may in the first run be divided into internal and external validity. Internal validity is “the ability of your design to test the hypothesis that it was designed to test”, while external

validity of a study is whether the results may be extended "beyond the limited research setting and sample in which they were obtained" (Bordens and Abbott, 2008). Reasons for sick leave are difficult to investigate since it is personal and may wary between individuals. The aim for this thesis is not to unveil the complete reasons for sick leave, but rather to investigate if there are any correlations between certain personal and work related characteristics and sick leave. The research done for this thesis is further concentrated on a special case; SAS in Norway. By focusing on this division of Scandinavian Airlines the thesis may lack external validity, the results generated may not be similar to other studies due to the specific characteristics of both the aviation business in general and SAS in Norway in particular. A similar study of the Swedish and Danish divisions may give completely different results due to the differences in work related characteristics.

Validity of measurement may be divided into content validity, construct validity, criterion-related validity and face validity (Bordens and Abbott, 2008). Content validity means that "the measurement instrument covers all the attributes of the concept you are trying to measure – that nothing relevant to the phenomenon under investigation is left out" (Frankfort-Nachmias and Nachmias, 2007). As mentioned above, the aim is not to uncover every reason to sick leave. The first parts with questions concerning demographics and work related characteristics are simple and straightforward. The questions contain few alternatives, though covering the range of differences between the respondents. The last parts concerning factors which are thought to affect the general work day are not believed to be complete, but close to it without leaving out important factors.

Construct validity of a questionnaire can be established by "showing that the questionnaire's results agree with predictions based on theory" (Bordens and Abbott, 2008). This method of checking the validity may be valid for the questions based on previous research.

Criterion-related validity of a questionnaire involves "correlating the questionnaire's result with those from another, established measure" (Bordens and Abbott, 2008). SAS

has complete statistics covering sick leave for the previous years, and to ensure the validity of the questionnaire the aim was to compare it against this.

Face validity describes ”how well a measurement instrument appears to measure (judging by its appearance) what it was designed to measure” (Bordens and Abbott, 2008). The face validity of the questionnaire may not be that high for the initial parts, but the last parts may rank higher on this measurement. Face validity is not as important as the other types of validity, but a lack of face validity may lead the respondents to develop a negative attitude towards the usefulness of the survey. Since the questions which are not that face valid is few and small, this may not be an issue.

Reliability is defined by Bordens and Abbott (2008) as the “ability of a measure to produce the same or highly similar results on repeated administrations”. This definition means that if the questionnaire was conducted several times, it would produce the same or nearly the same result. Bordens and Abbott (2008) describes two major applications for how to increase the reliability of a questionnaire; the test-retest method and the split-half method. Due to the time and efforts needed to implement one of these methods none of them were carried out in this study. Rogers (1995) reproduced by Bordens and Abbott (2008) presents four steps one might take to increase the reliability of a questionnaire. Three of these steps were considered during the design of the questionnaire. The first is to increase the number of items on the questionnaire, the second is to standardize administration procedures while the third is to make sure that the questionnaire is clear, well written and appropriate for the sample. Standardized administration procedures involve procedures concerning the actual process of answering the questions, e.g. surroundings and equipment available for the respondent.

The number of items presented in the questionnaire is held at the minimum to avoid boredom and tiredness, which may reduce the reliability of the survey. The possible liabilities of having fewer questions were compared with the benefits of having more respondents and thereby increase the validity. It is further difficult to standardize the administration procedures since the questionnaire was distributed through the web. There is though reason to believe that most of the participants took the survey at the

crew resting facilities either at OSL, SVG or TRD, thereby having approximately the same conditions. A great effort was put into making the questionnaire as clear, well written and appropriate for cabin crew as possible. A better analysis of the reliability of the questionnaire will be conducted during the analysis of the results from the questionnaire.

4.3 Data analysis

The data collected through the survey and the use of QuestBack was analyzed with the program Statistical Packages for Social Science (SPSS) version 17 through 19. A file with the data which was compatible with SPSS was downloaded directly from QuestBack when the survey was ended. Some sort of screening and cleaning of this file had to be performed before the analysis could start. Pallant (2005) explains that one first and foremost have to screen the data for any values that fall outside the range of possible values for a variable. Since the survey mainly contained questions which required the respondent to tick boxes, this proved not to be a major problem. A couple of questions that though led to some manual work was the questions regarding the age of the children living in the household during 2010, residence of cabin crew and the number of years employed as cabin crew in SAS. Since these questions were open-ended or contained open-ended options, the authors had to code each of the answers into testable numerical variables. This was done manually by one of the authors and then checked by the other.

The data gathered through the survey may be grouped into two classes; categorical and numerical data. The categorical data cannot be placed in a logical order since the responses belong to groups or categories. Examples of such questions are the one regarding gender where the options are male and female. Numerical data on the other hand may be put in a logical order since there is equal distance between the values given. It may further be divided into discrete numerical variables and continuous numerical variables (Newbold, Carlson and Thorne, 2010). The division between these two types of numerical data have not been performed in this thesis since it was deemed not necessary. An example of questions regarding numerical data is the one asking for the age of the respondent.

There are mainly four statistical bases which have lead to different methods used to analyse the research questions in this study. When 1) running categorical data against other categorical data, cross tables proved to be the most efficient approach. When 2) running categorical data against continuous data or vice versa, comparing of means through the independent sample T-test and one-way ANOVA proved to be the best option. The independent sample T-test was used when the categorical data only consisted of two answer categories while the one-way ANOVA method was used when there were more than two categories. When 3) checking for correlation between continuous variables, bivariate correlation was the most suitable alternative. Multiple regression analysis 4) was used to explore the relationship between one dependent variable and several independent variables. Multiple regressions are in general based on correlation but have the ability to explore the interrelation between the characteristics (Pallant, 2005). In this thesis multiple regression was used to investigate how well the personal and work related characteristics uncovered from the survey was able to explain the level of sick leave when tested together. There are several types of multiple regressions and in this case stepwise multiple regression was used. It allows SPSS to "select the variables it will enter and in which order they go into the equation, based on a set of statistical criteria" (Pallant, 2005). Stepwise multiple regression was chosen due to the amount of independent variables.

Some of the questions asked were recoded into new variables to better analyse the hypotheses. Table 4.6 gives an overview of the variables created with background in the research questions and which tests that were performed and variables used when checking the hypotheses. The descriptions in parentheses are the values derived from the questionnaire. All of the variables was also analysed through the stepwise regression method.

Hypothesis	Description	Variables	Tests
$H_1$1	Gender	Sick (yes/no)	Independent sample T-test
		Gender	Independent sample T-test
$H_1$2	Age	Sick (yes/no)	Independent sample T-test
		Age	Bivariate correlation
		Age > 49 (older/younger)	Independent sample T-test
$H_1$3	Position fraction	Position fraction (part time/full time)	Independent sample T-test
		Position fraction (28-40/60/80/100)	One-way ANOVA
$H_1$4	Children in household	Sick (yes/no)	Cross-table
			Independent sample T-test
		Children in household (yes/no)	Independent sample T-test
		Children in household (number)	Bivariate correlation
		Children age 0-12 (yes/no)	Independent sample T-test
		Children age > 12 (yes/no)	Independent sample T-test
		Children age 0-12 (number)	Bivariate correlation
		Children age 0-3 (number)	Bivariate correlation
		Children age 4-7 (number)	Bivariate correlation
		Children age 8-12 (number)	Bivariate correlation
$H_1$5	Marital status	Marital status	One-way ANOVA
$H_1$6a	Means of transport	Car (yes/no)	Independent sample T-test
		Boat (ye/so)	Independent sample T-test
		Bus (yes/no)	Independent sample T-test
		Airport Express train (yes/no)	Independent sample T-test
		Train (yes/no)	Independent sample T-test
		Tram (yes/no)	Independent sample T-test
		Subway (yes/no)	Independent sample T-test
		Airplane (yes/no)	Independent sample T-test
		Means of transport (private/public)	Independent sample T-test
$H_1$6b	Means of transport	Sick (yes/no)	Independent sample T-test
		Means of transport (number)	Bivariate correlation
$H_1$6c	Residence, Base	Vicinity to base (away/near)	Independent sample T-test
$H_1$7	Base	Base (OSL/TRD/SVG)	One-way ANOVA
$H_1$8	Group	Group (fixed/variable)	Independent sample T-test
$H_1$9	Routes	Routes (long-/short-haul)	Independent sample T-test
$H_1$10	Years employed	Sick (yes/no)	Independent sample T-test
		Years employed	Bivariate correlation
$H_1$11	Position	Position (AP/AS+AH)	Independent sample T-test
		Position (AP/AS/AH)	One-way ANOVA

Table 4.6: Overview of variables created and used

4.4 Ethical issues

The questionnaire was developed with a background in interaction with and observation of the cabin crew at SAS. The crew interviewed did not at the time know about the intentions of the interviewer. The interviews led to some of the mentioned research questions, but even the interviewer did not know about the outcome of the research prior to the thesis. Not stating the intensions may be viewed as unethical, but the uncertainty regarding the goals made it necessary.

The questionnaire is completely anonymous due to the use of an URL sent out together with the email. It is further impossible to track the individual IP-addresses since such a tool is not available and most of the respondents probably answered the questionnaire from a non-private computer at one of the crew rest areas. The questions on the other hand are of such a character that one might be able to distinguish between groups of crew and thereby profile individuals quite detailed. One might for example manage to find out who the 40 year old women, with three kids, living in Telemark and working 80% on short routes is, but to do so one has to hold massive information about the whole staff, a criterion which may not be that believable. The questionnaire is further reviewed and approved by staff at Molde University College working within social science and ethics.

4.5 Limitations

There are some limitations to the research done that are worth mentioning. These limitations apply mainly to the questionnaire, from design to execution.

Order effects may have affected the respondent when answering the seven last questions regarding their opinion of the factors presented. Friedman and Amoo (1999) refer to research done by Mathews (1929), Holmes (1974) and Friedman, Friedman and Gluck (1988) which shows that there is “evidence of a bias towards the left side of the scale”. In the survey, the negative statements are placed on the left side of the rating scale while the positive is placed on the right side. This division may lead to a higher rate of negative responses. The solution to this problem could have been to turn the scale for half of the respondents, letting the positive side be at the left. This was not an option for this thesis

since there was no opportunity to manage the invites sent out. SAS sent it out to one common email address covering all the cabin crew.

Due to the inverted funnel approach the respondent may notice that the authors are probing especially after reasons for sick leave. This may have lead to context effects as described by Friedman and Amoo (1999). They claim that respondents often will use previous questions to "interpret the meaning of a question and/or to determine what the 'proper' answer is supposed to be". Smith (1991) explains that context effects are more likely to appear in questions that "(1) require wide-ranging memory searches because the subject covers many relevant memories, (2) access memories that have not been previously organized into a summary evaluation that supplies a simple, direct answer to the question being posed, and (3) utilize ambiguous terms and/or have uncertain intent". Smith further explains that these are not the only one causing plausible context effects, but they are the most common. Problems with context effects may occur with the seven last questions in the survey (appendix 5). The aim of these questions is to discover the opinion of the respondent regarding a range of factors concerning a regular work day. The questions leading to these seven, concerns sick leave in an increasing degree, giving the respondent a hunch of what the aim of the survey is. Further these questions fall in under the first and second types of questions described by Smith.

The questionnaire concerns the situation of cabin crew in 2010, demanding the respondent to remember situations occurring between one and thirteen months ago. Bradburn, Rips and Shevell (1987) refers to a study conducted by Wagenaar, Cognit and Psychol in 1986 which states that 20% of critical details were irretrievable after one year. Information about sick leave may not be viewed as critical by the respondent and thereby lead to an even higher loss of details. The results of the survey may suffer from this since it may gather less accurate information from the first parts of 2010. This problem may though have been avoided due to few questions demanding retrieval of memory.

The choice of having compulsory questions may have affected the amount of respondents. During the execution of the survey the authors got the knowledge of one part in particular that caused problems. This question, number 13.2 in appendix 5,

demands the respondent to tick the box *Not occurred* if the alternatives listed did not occur as a reason for their sick leave. Respondents forgetting this then got an error message explaining that they must tick all the boxes. Approximate five of the cabin crew reported orally or by email that they had problems with this section, and therefore not finishing the survey. There is reason to believe that the number of unreported problems is higher, but this does not affect the validity of the questionnaire in a largely negative degree. To prevent further problems regarding this question, the reminder sent out was updated to include a guide on how to avoid such errors (appendix 8).

SAS distributed the survey through an email carrying the name of the manager for cabin safety. A possible drawback with the distribution can be that cabin crew may be tired of mailings from management, especially surveys since a large survey with several reminders was conducted in December of 2010. But since the email is signed by someone outside the management this effect may have been reduced. A drawback mentioned by one of the crew regarding the distribution is that the survey was not mandatory to attend, in contrast to other mailing about courses and surveys sent out by management. It was therefore easier not to attend it.

Further the respondents were able to answer the questionnaire several times since the URL generated by QuestBack was used. This does not register the respondent in any way and it is therefore not manageable to deny anyone to open it more than once. This may have opened for personnel with a hidden agenda, but it is not believed to be a major problem. Further, the survey may only have been taken by those who feel the need to be heard and those who have encountered problems with the system. Potential respondents without anything to report may have felt that this survey did not seek their opinion and thereby not answer it.

The question regarding years employed in SAS was designed to exclude those who had worked in e.g. SAS Ground Handling (SGH) before becoming cabin crew. This lead to a problem since there was an amount working as cabin crew in Braathens before the companies merged in 2002. With regards to reasons for sick leave it is equally important to include cabin crew from Braathens as well as cabin crew working in SAS. Therefore, by

asking for how long they had been employed as cabin crew in SAS, there may be different interpretations of it. There is no way to distinguish if the respondents answered the question the way it was intended; how long they had been working as cabin crew.

At last, the approach chosen for the analysis through regression was the stepwise method. The literature is somewhat uncertain about the method as there are several limitations connected to it. Conroy states that the "method will not necessarily produce the best model if there are redundant predictors" and further "models identified by stepwise methods have an inflated risk of capitalising on chance features of the data". He also quoteed Judd and McClelland who states that "it is unwise to let an automatic algorithm determine the question we do and do not ask about our data" (Conroy, 1998). Johannessen (2007) recommend this method when being in the explorative phase of a research since the result from the regression analysis may differ from the expected result. The authors though chose this method due to the range of dependent and independent variables and the time limit of this thesis.

5.0 Descriptive statistics

The descriptive results from the survey are presented in this chapter. Four main parts are addressed; sample and population, validity, results of the research question and work related factors and comments.

Descriptive statistics is the method used to process, present and interpret quantitative data. It involves graphical representations, mean, variation and correlations, and is used to present the raw data in a straightforward way. Tables and figures are used to visually present the data (Befring, 2007). In this thesis graphs will be provided for the descriptive questions, while tables will be presented for the work related factors.

5.1 Sample and population

The questionnaire was sent out to approximately 1001 respondents (appendix 11) on Thursday 27th of January, 2011. By the 1st of March 423 responses was generated. This gives a response rate of 42,26% of the total population. A simple calculation of recommended sample size proves that 423 respondents cover the minimum of 285,8 answers required (calculation 5.1) and may therefore be viewed as valid. Yamane, reproduced in Israel (1992), provides the formula for determining the sample size. To do the calculation a confidence level of 95% is considered giving e, the desired level of precision, equal to 0,05. The desired level of precision and the confidence level are chosen due to general statistical theory. N is the total population while n indicates the size of the sample.

$$n = \frac{N}{1 + N(e)^2} = \frac{1001}{1 + 1001(0{,}05)^2} = 285{,}8$$

Calculation 5.1: Yamane's formula for determining sample size for 1001 respondents (Israel, 1992)

If the assumption regarding the amount of respondents receiving the questionnaire proves wrong, the sample size needed still will be less than the amount of responses gathered (calculation 5.2). N=1218 is the number of cabin crew employed in SAS by

January 1. 2011, while 1001 is the number of cabin crew subtracted the amount believed to be on various kinds of leave.

$$n = \frac{N}{1 + N(e)^2} = \frac{1218}{1 + 1218(0{,}05)^2} = 301{,}11$$

Calculation 5.2: Yamane's formula for determining sample size with 1238 respondents (Israel, 1992)

Figure 5.1 shows how the responses were distributed throughout the period of the survey. The reminders, as described in the methodology, were sent out the 14th and 18th of February, resulting in an increase in responses from the 14th. Since the survey was distributed just before the weekend, a decrease in responses was experienced the 3rd and 4th day, before it peaked on Monday the 31th of January.

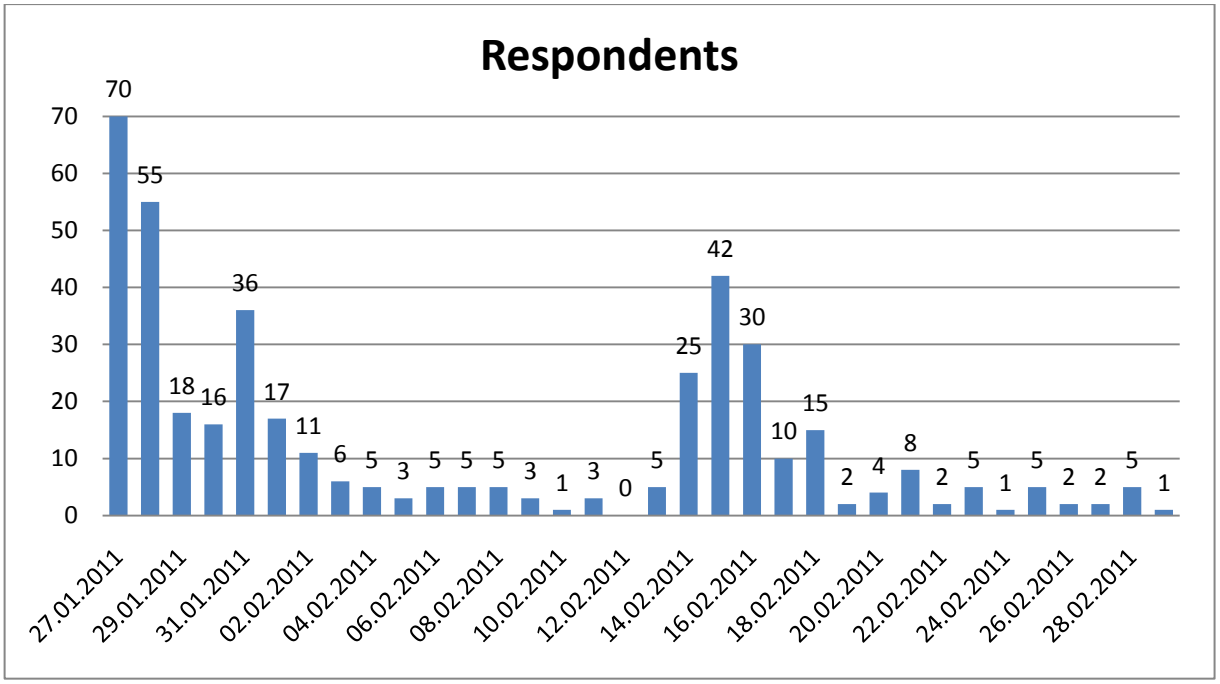

Figure 5.1: Number of respondents per date. n=423

5.2 Validity

Criterion-related validity is described by Bordens and Abbott (2008) as "correlating the questionnaire's result with those from another, established measure". SAS has statistics covering sick leave and complete overviews of work related characteristics of their employees (appendix 11). To prove the validity of the questionnaire the results from the survey is compared with existing overviews as showed in table 5.1. Table 5.1 consists of numbers from table A11.1 subtracted the numbers in A11.2. This shows that the response rate of 42.26% is fairly representative within all the different groups. It further shows that the results are reasonably valid regarding those who had OSL and TRD as their base, the actual rate of response only deviates from expected with 0,22% and 7,90% respectively. This is also the case for those working in the fixed and variable group with a deviation of -6,76% and 4,34% respectively. It is further valid for those working short-haul with a deviation of 2,22%. At last it proves valid for crew working as AH, the deviation here is -2,15%.

The notation *Population* in table 5.1 describes the average of employees in 2010, while *Respondents* accounts for the amount within the category which answered the questionnaires. *%* in the table gives the percentage of the population in the category which answered the questionnaire (E.g. 42,35% of the crew at OSL answered the survey, 360 of 850). The notation *Expected* gives the expected percentage of employees in the category per total answered (E.g. 84,92% of the possible respondents had OSL as their base, 850 of 1001). *Actual* gives the actual percentage of the respondents answering the survey per category (E.g. 85,11% of the respondents answering the survey had OSL as their base, 360 of 423). At last the notation *Deviation* gives *Expected* divided by *Actual.* This explains the deviation between actual respondents and expected.

	Population	Respondents	%	Expected	Actual	Deviation
Responses	1001,00	423	42,26 %			
Base						
OSL	850,00	360	42,35 %	84,92 %	85,11 %	0,22 %
TRD	85,00	39	45,88 %	8,49 %	9,22 %	7,90 %
SVG	66,00	24	36,36 %	6,59 %	5,67 %	-16,21 %
Sum	1001,00	423		100,00 %	100,00 %	
Position fraction						
28-40%	122,45	36	29,40 %	12,23 %	8,51 %	-43,74 %
60 %		85			20,09 %	
80 %		128			30,26 %	
Sum part time	420,78	213	50,62 %	42,04 %	50,35 %	16,52 %
100 %	457,76	174	38,01 %	45,73 %	41,13 %	-11,17 %
Sum	1001,00	423		100,00 %	100,00 %	
Group						
Fixed	455,50	163	35,78 %	41,73 %	39,09 %	-6,76 %
Variable	636,00	219	34,43 %	58,27 %	52,52 %	-10,95 %
Resource pool		35			8,39 %	
Sum Variable	636,00	254	39,94 %	58,27 %	60,91 %	4,34 %
Sum	1091,50	417		100,00 %	100,00 %	
Routes						
Missing		7			1,65 %	
Short-haul	802,94	347	43,22 %	80,21 %	82,03 %	2,22 %
Long- haul	198,06	69	34,84 %	19,79 %	16,31 %	-21,30 %
Sum	1001,00	423		100,00 %	100,00 %	
Position						
AP	305,72	143	46,77 %	30,54 %	33,81 %	9,66 %
AS	76,43	24	31,40 %	7,64 %	5,67 %	-34,58 %
AH	618,84	256	41,37 %	61,82 %	60,52 %	-2,15 %
Sum	1001,00	423	-	100,00 %	100,00 %	-

Table 5.1: Validity. Source: SAS (2011j ,2011k)

5.3 Research questions

The research questions are presented in this section, and the presentation follows the order of which the hypotheses are presented. A section regarding the dependent variables is presented at the end of the section.

5.3.1 Gender

The response to question 1.0 provided the distribution between the genders. Out of 423 respondents, there were 69 males and 354 females, which gives a percentage distribution of 16,3% males and 83,7% females. Figure 5.2 illustrates the distribution between the genders in percentage.

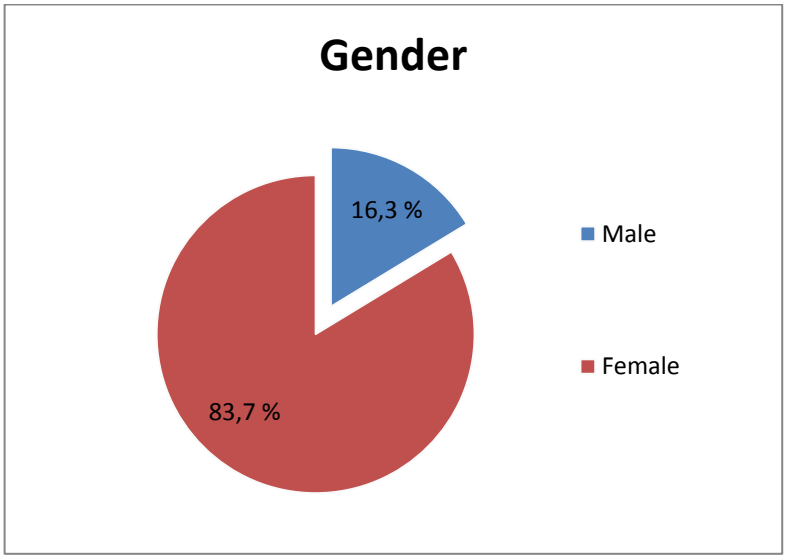

Figure 5.2: Gender – percentage. n=423

5.3.2 Age

In question 2.0 the respondents entered their age. The youngest was 23 years old and the oldest was 63 years old. The average mean of age of the cabin crew was 43,76 years. The distribution of age is shown in the figure 5.3.

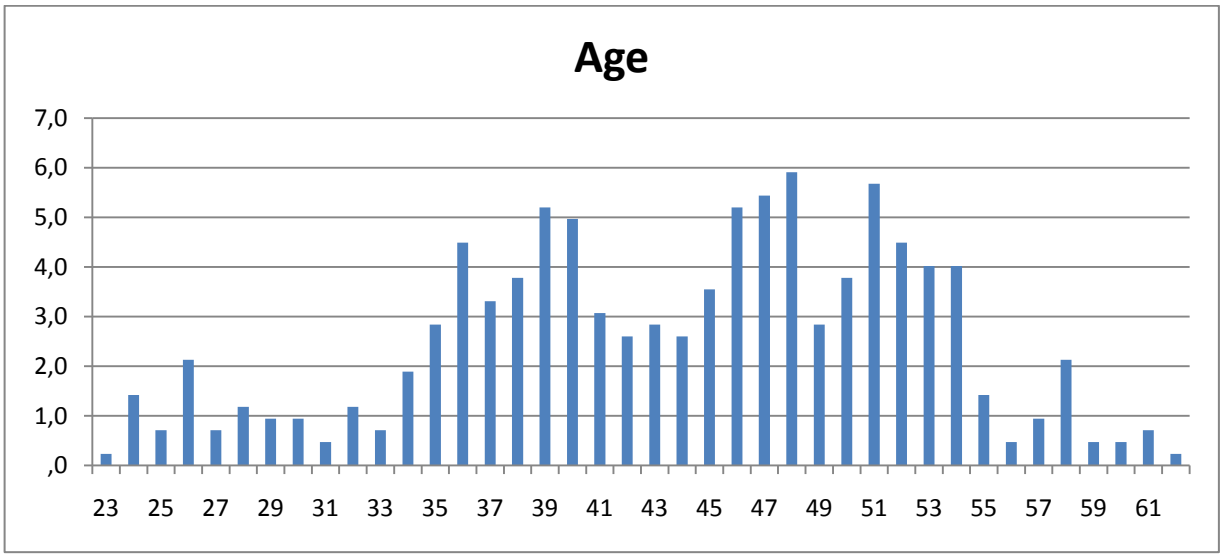

Figure 5.3: Age – percentage of crew per age category. n=423

5.3.3 Position fraction

In question 8.0 regarding position fraction, 36 answered that they worked 28%-40% (8,5%). 85 had a position fraction of 60% (20,1%), 128 worked 80% (30,3%) and 174 worked 100% (41,1%). This is illustrated in figure 5.4 in percentages.

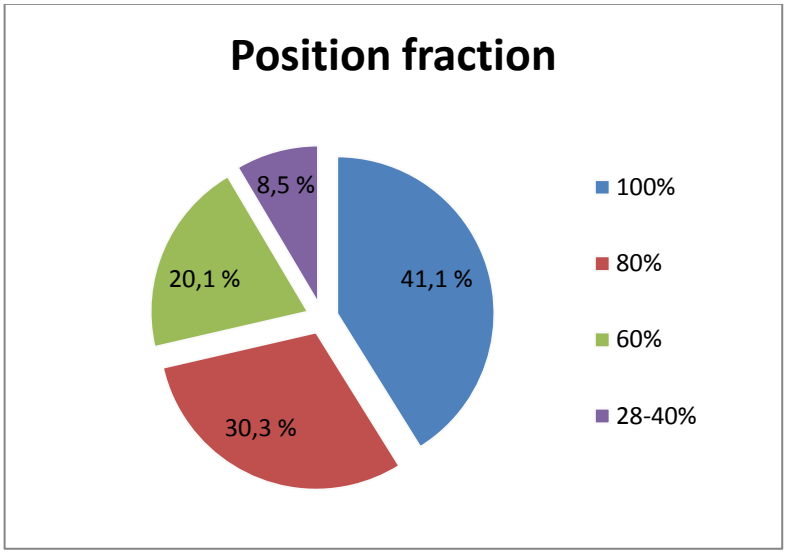

Figure 5.4: Position fraction – percentage. n= 423

5.3.4 Children in household

In question 4.0, 254 answered that they had children in their household in 2010 (60,0%). 168 answered that there was no children in their household (39,7%) and 1 did not wish to answer (0,2%). In total there were 476 children. Of the 422 respondents that answered *Yes* or *No*, the average mean of children in household was 1,13 and there were maximum 6 children in the households. Number of children in household and the distribution of them are presented in table 5.2. 16,3% of the crew had e.g. 1 child in their household, while 30,7% had 2 children.

Children	Amount							n
Description	0	1	2	3	4	5	6	
Number of children	41,8 %	16,3 %	30,7 %	10,2 %	0,0 %	0,7 %	0,2 %	422
Children, age 0-12	63,8 %	17,3 %	15,6 %	2,8 %	0,2 %	0,2 %	-	423
Children, age > 12	66,3 %	15,4 %	15,1 %	2,6 %	-	-	-	423

Table 5.2: Overview of children in household.

When categorizing the children in groups of ages between 0 to 12 years old, there were 153 of 423 in total that had children within the range of 0 to 12 years old (36,2%). These numbers are presented in table 5.2. 73 of these had 1 child (17,3%) between the ages 0 and 12 years, 66 had 2 children (15,6%), 12 had 3 children (2,8%), 1 had 4 children (0,2%) and 1 had 5 children (0,2%) between the 0 and 12 years old. This is presented in table 5.2. Children of the age 12 and above were also categorised. 140 respondents of 423 had children that was over 12 years old (33,1%), 65 had 1 child over the age of 12 (15,4%), 64 had 2 children (15,1%) and 11 cabin crew had 3 children over the age of 12 (2,6%).

The age of the children was further categorized by narrower groups of age. 41 of the 423 respondents answering the question had children between the ages 0 and 3 (9,7%). There were 61 that had children between the ages 4 and 7 (16,3%), 90 of the respondents had children between the ages 8 and 12 (21,3%), 121 respondents that had children between 13 and 18 years old (28,6%) and 49 of the respondents had children over 18 in their household in 2010 (11,6%). The distribution of children between the ages of 0 and 3, 4 and 7, 8 and 12, 13 and 18 and above 18 years old is illustrated in figure 5.5.

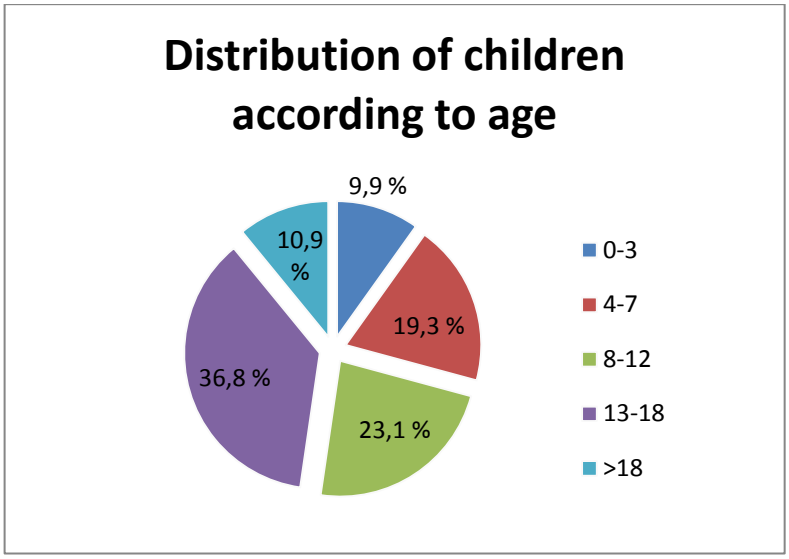

Figure 5.5: Distribution of children according to age. n=476 (the total number of children)

5.3.5 Marital status

Of 423 respondents, 195 was married (46,1%), 103 was in a cohabitant relationship (24,3%), while 97 was single (22,9%). When asked about martial situation 26 answered *Other* (6,1%). Further, 2 did not wish to answer, which equals to 0,5%. The relationship between the different marital statuses is illustrated in figure 5.6.

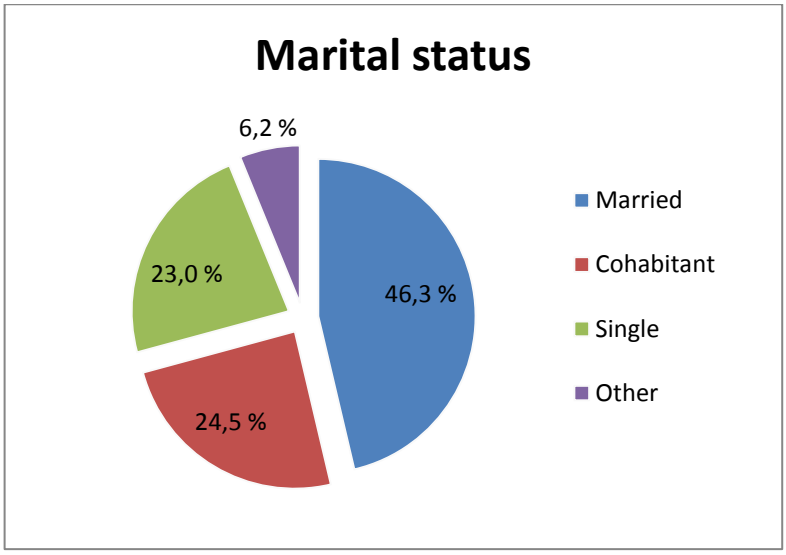

Figure 5.6: Marital status – percentage. n=421

5.3.6 Commuting

The three hypotheses regarding commuting are analysed based on two questions, means of transport and place of residence. The descriptive statistics for these two questions are presented below.

5.3.6.1 Means of transport

In question 7.0 the respondents answered which transport mode they mainly used to and from work. 235 answered that they used a car as one of their main transport modes (55,6%), 140 answered the Airport Express Train (33,1%), 131 mainly used the bus (31%), 58 took the train (13,7%), 47 answered airplane (11,1%), 13 used the subway (3,1%), 6 answered boat (1,4%) and 6 answered that the tram (1,4%) was one of their main transport modes. 2 respondents choose to specify that Taxi was one of their the main transport modes (0,5%). Figure 5.7 shows the relationship between the different transport modes with the number of respondents.

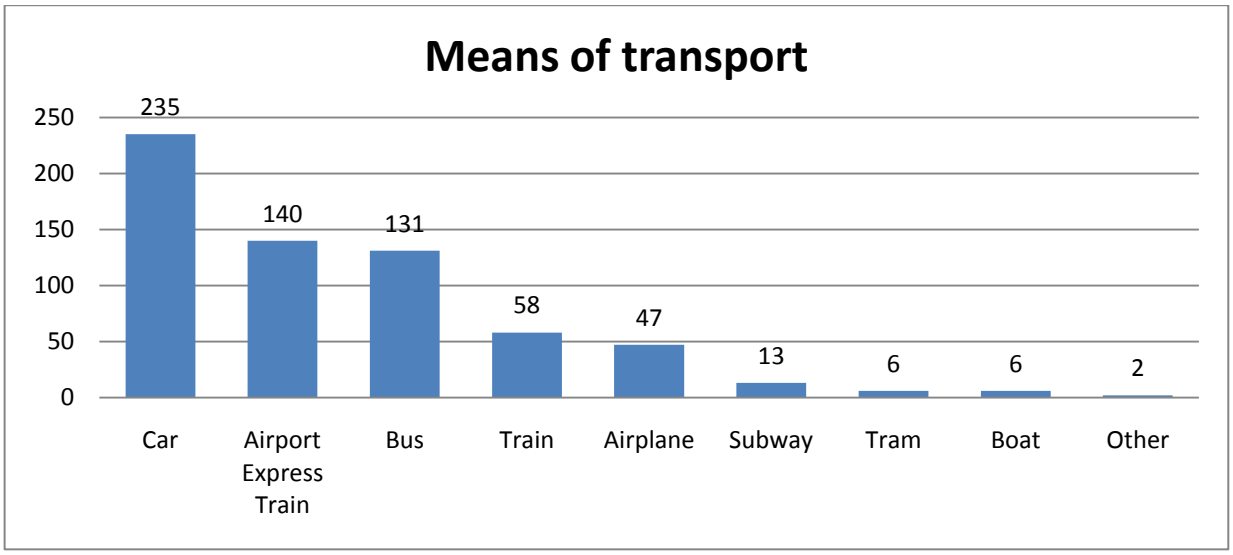

Figure 5.7: Means of transport – number of responses per mode of transport. n=638 (allowed to answer several of the alternatives)

5.3.6.2 Residence

When asked about the location of their residence, 94,6% answered that they lived in Norway. 249 of 423 (59,9%) respondents answered that they lived in Oslo and Akershus, with 126 (29,8%) and 123 (29,1%) respectively. 4 did not wish to answer (0,9%). 10 answered London, Stockholm, Gothenburg, Copenhagen or Malmö (2,4%) while 9 chose

the option *Other* (2,1%). Figure 5.8 shows the distribution of the number of cabin crew with residence in the different locations.

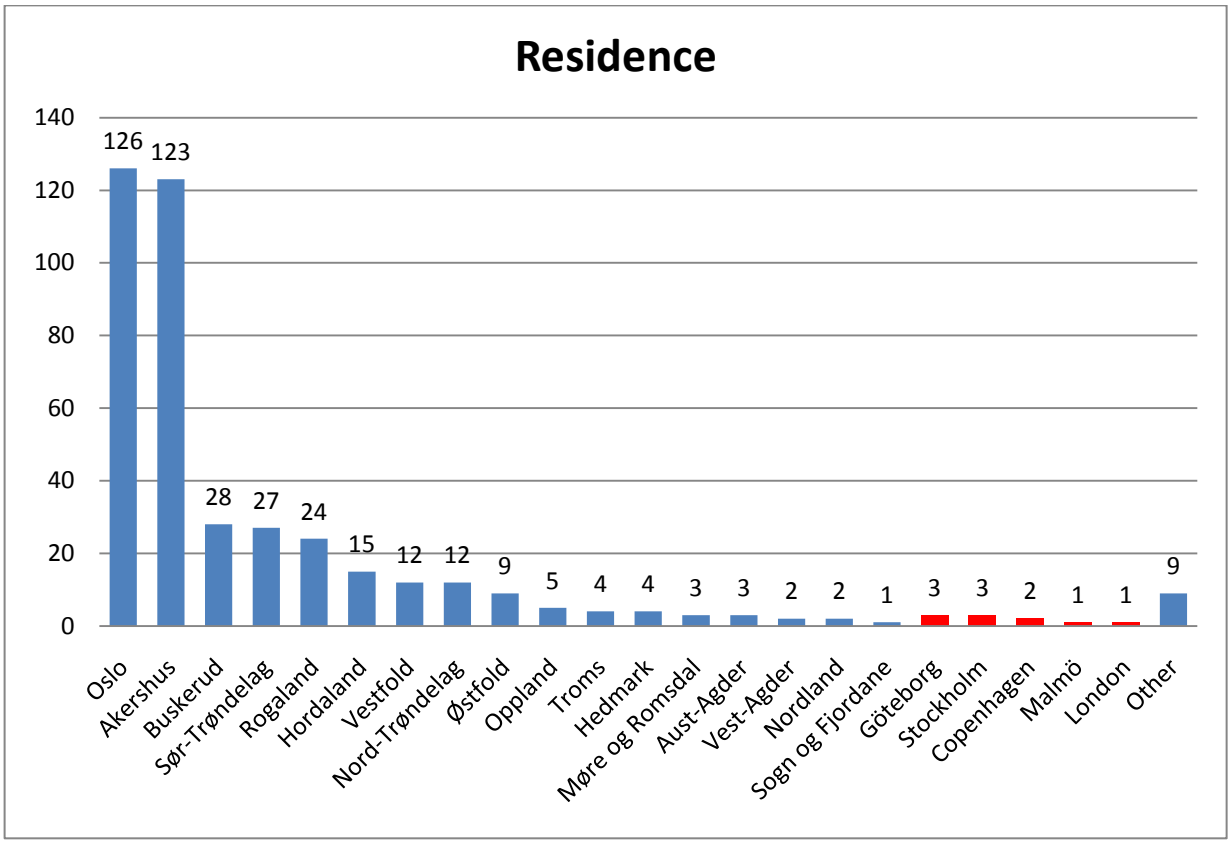

Figure 5.8: Residence – number of respondents per residence. n=419, Blue=Norway and Red=Outside Norway.

5.3.7 Base

When asking which base they were employed at, 360 0f 423 answered that they were employed at OSL (85,1%), 39 was employed at TRD (9,2%) and 24 was employed at SVG (5,7%). Figure 5.9 shows the distribution of cabin crew between the bases in percentages.

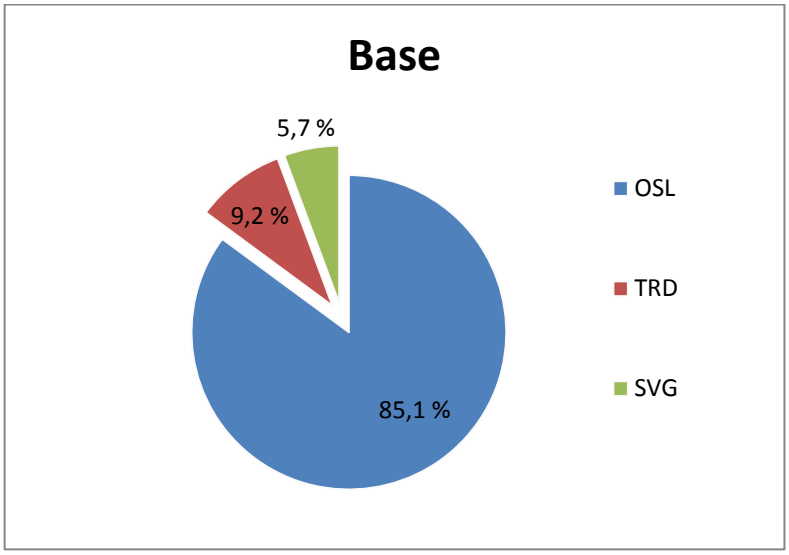

Figure 5.9: Base – percentage. n=423

5.3.8 Group

There were 163 working in the fixed group (38,5%), 219 in the variable group (51,8%) and 35 worked in the resource pool (8,3%). There were six missing variables in this question (1,4%), reducing the total number of respondents to 417 of 423 possible. The percentages are shown in figure 5.10 below.

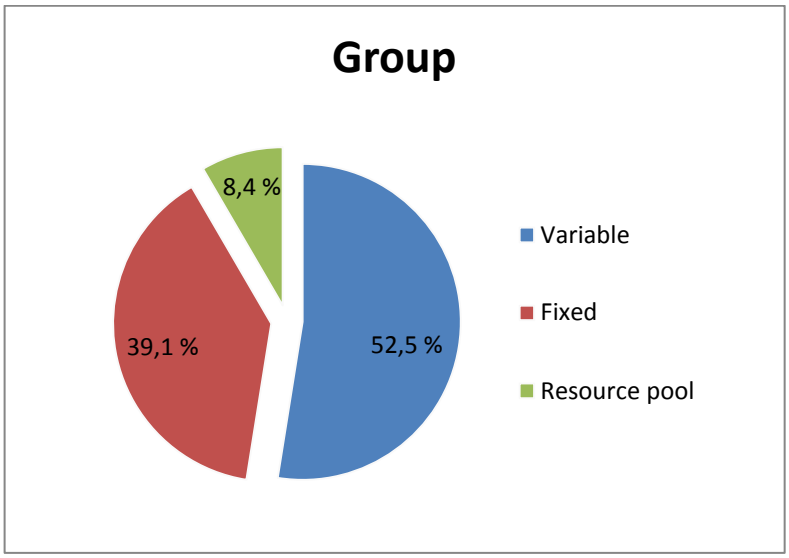

Figure 5.10: Group – percentage. n= 417

5.3.9 Routes

In question 10.0 the respondents were asked which routes they operate. 69 operated long- and short-haul (16,3%) while 347 operating short-haul only(82,0%). There were seven missing variables in this question, reducing the total number of respondents to 416 of 423 possible. The percentages are shown in figure 5.11.

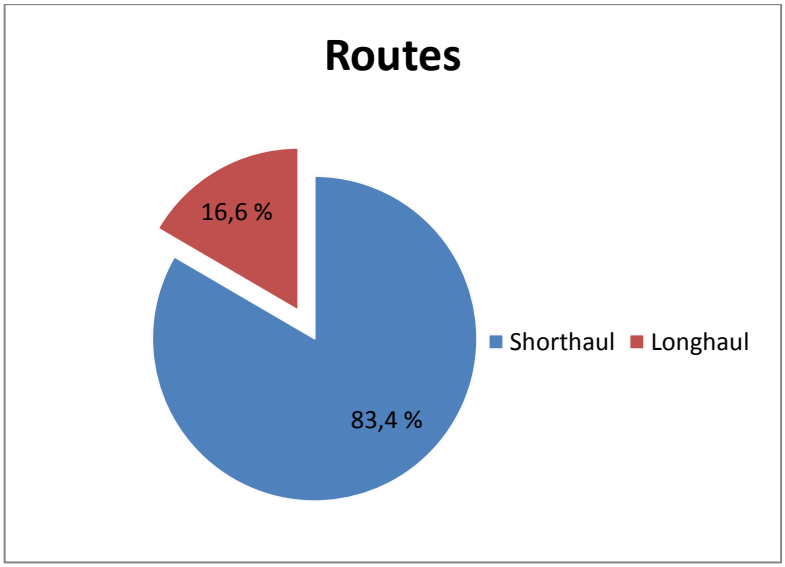

Figure 5.11: Routes – percentage. n= 416

5.3.10 Years employed in SAS

In question 12.0, the respondents were to answer how long they had been working as cabin crew in SAS. Out of 423 possible respondents, 2 answered *Don't Know* (0,5%). 420 answered how long they had been employed (99,5%). The number of years employed as cabin crew ranged from 2 years up to 40 years. The average mean of years was 17,46. There were 1 missing variable in this question (0,2%). Figure 5.12 show the distribution between numbers of years employed as cabin crew in SAS and number of respondents.

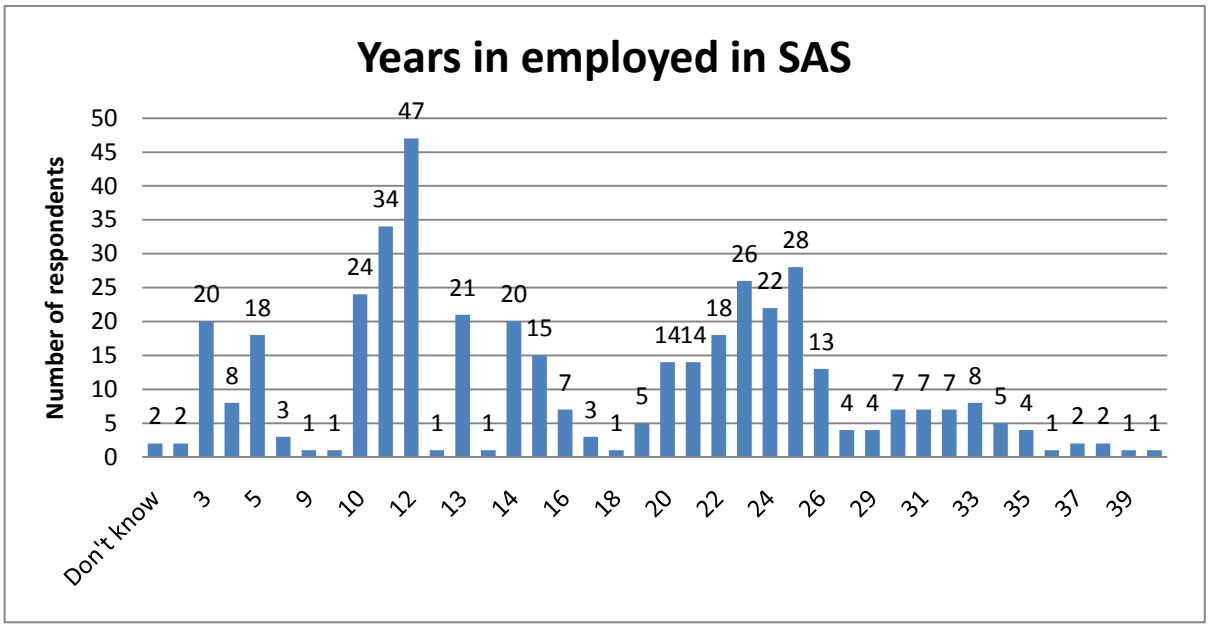

Figure 5.12: Years employed in SAS – number of respondents per age category. n=422

5.3.11 Position

In question 11.0, 256 answered that they was employed as AH (60,5%), 143 answered that they were employed as AP (33.8%), while 24 was employed as AS (5,7%). The percentages are shown in figure 5.13 below.

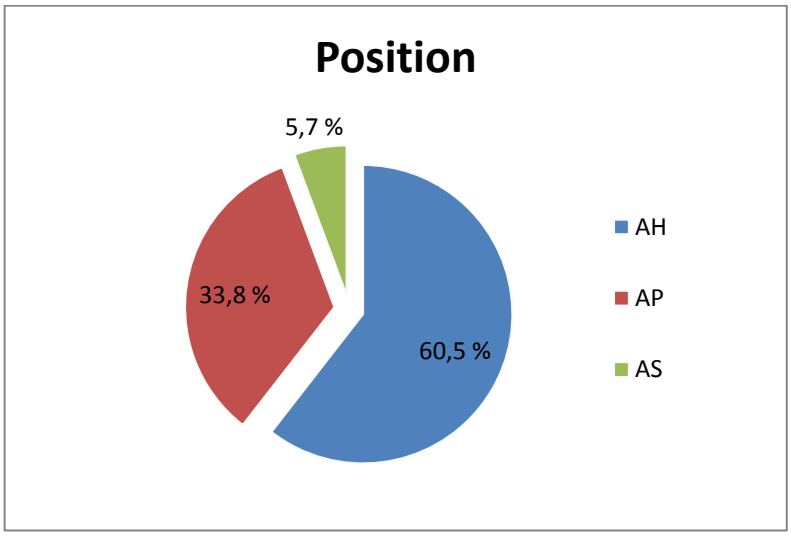

Figure 5.13: Position – percentage. n=423

5.3.12 Sick leave

This section regards sick leave and is divided into three parts, one regarding whether the respondent were sick or not, a second part regarding the amount of sick leave the respondent reported to have during 2010, and a third part regarding the reasons for sick leave.

5.3.12.1 Sick or not

In question 13.0 the respondents answered whether or not they called in sick to Crew Control in 2010. Crew Control is the division in SAS taking care of the daily production and thereby the incoming sick leaves. 350 of 423 answered *Yes* (82,7%) while 68 answered *No* (16,1%). There were 3 that did not know (0,7%) and 2 did not wish to answer (0,5%). The percentages are shown in figure 5.14 below.

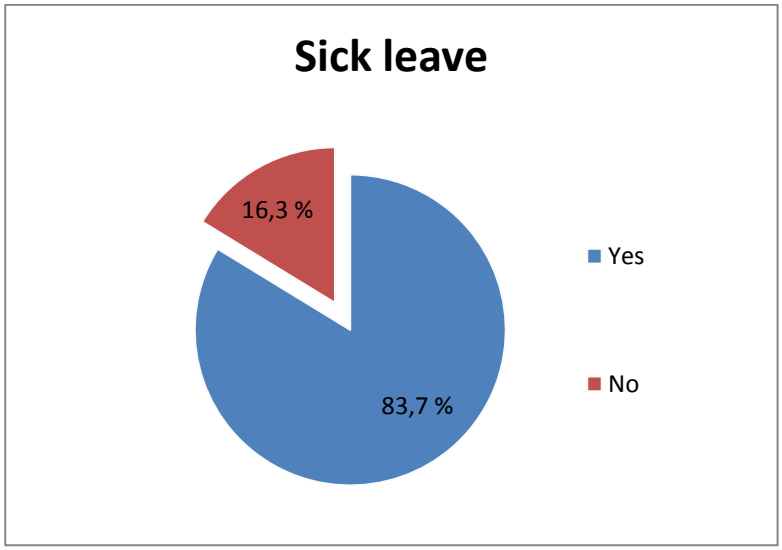

Figure 5.14: Sick leave – percentage. n=418

5.3.12.2 Number of sick leaves

350 of 423 answered question 13.1 regarding the number of times they called in sick in 2010 (82,7%). Further, 31 did not know how many times they had called in sick (7,3%). There were 73 missing variables in this question (17,3%). The reason for this is the routing of the previous question. Only the respondents answering that they were sick during 2010 got the opportunity to answer questions in this section. Figure 5.15 illustrates the distribution between the number of respondents and the number of times they had called in sick. The division in percentage is shown in figure 5.16.

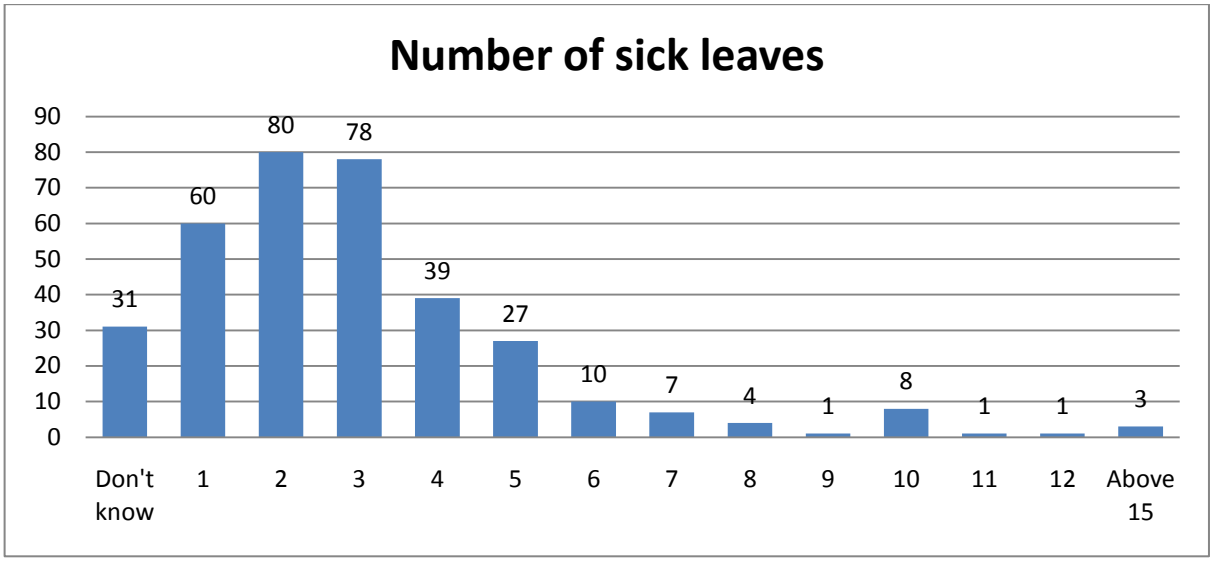

Figure 5.15: Number of sick leaves– number of respondents per amount of sick leave. n=350

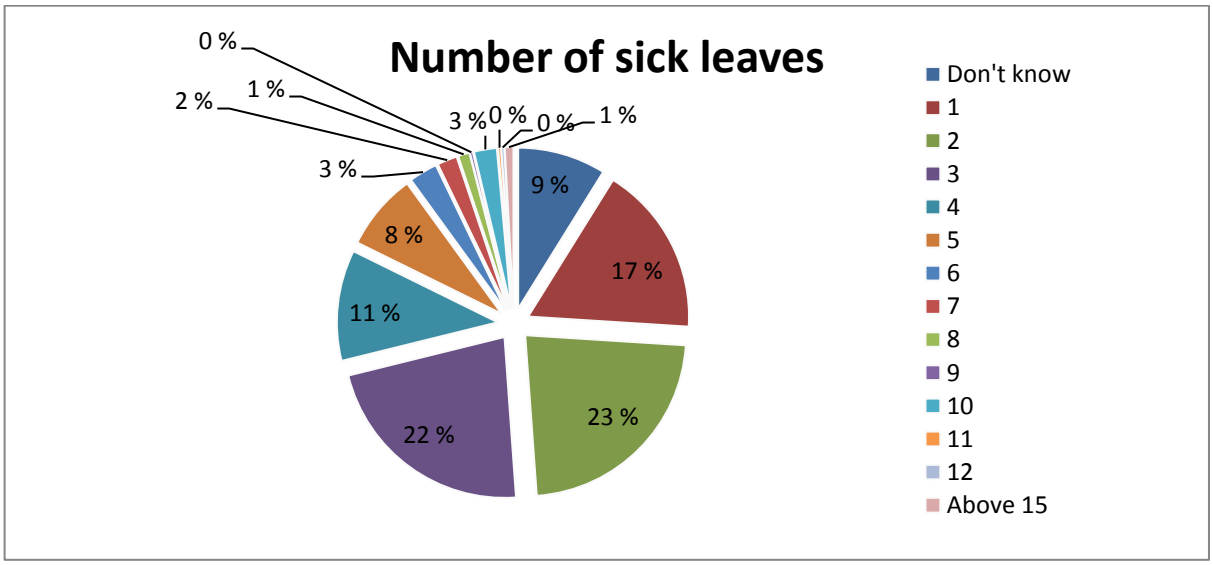

Figure 5.16: Number of sick leaves – percentage. n=350

5.3.12.3 Reasons for sick leave

In question 13.2 the respondents were asked to state the reason for sick leave. The first section concerned the number of times they had been on sick leave due to work related physical injuries. Out of 423 possible respondents 350 answered this question (82,7%) and there were 73 missing variables in this question (17,3%). 257 of 423 answered that work related physical injuries had not occurred (60,8%), 38 state that it had occurred 1 time (9,0%), 14 answered 2 times (3,3%), 5 answered 3 times (1,2%), 5 answered 4 times (1,2%) and 4 answered 5 times (0,9%). There were 6 that answered the work related

physical injury had occurred over 5 times in 2010 (1,4%) while 21 answered that they did not know (5,0%). The numbers are illustrated in figure 5.17 below.

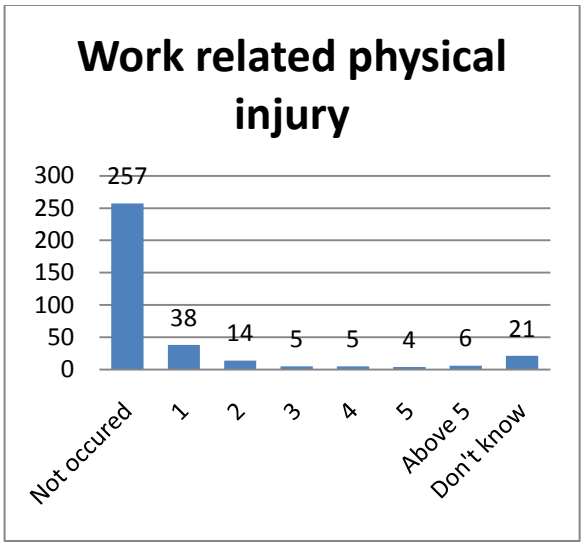

Figure 5.17: Work related physical injury – number of respondents per times occurred. n=350

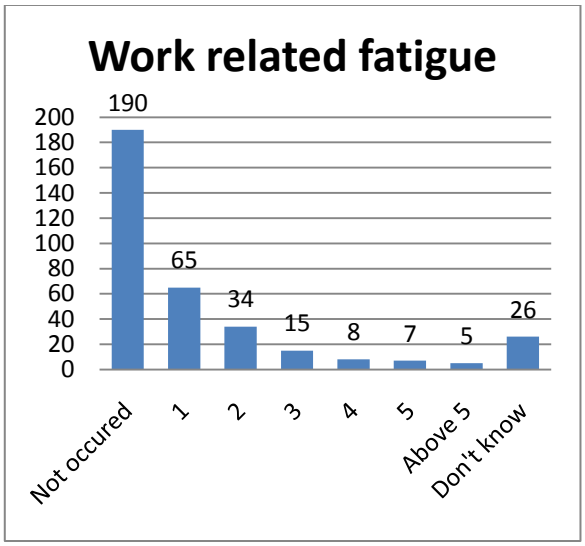

Figure 5.18: Work related fatigue – number of respondents per times occurred. n=350

The second section in question 13.2 concerned work related fatigue. 190 answered that work related fatigue did not occurred as a reason for sick leave in 2010 (44,9%), 65 stated that it had occurred 1 time (15,4%), 34 answered 2 times (8,0%), 15 answered 3 times (3,5%), 8 stated that it had occurred 4 times (1,9%) while 7 answered 5 times (1,7%). There were 5 that answered that work related fatigue had occurred above 5 times (1,2%) while 26 answered that they did not know (6,1%).The numbers are illustrated in figure 5.18 above.

The third section in question 13.2 concerned infections. 119 stated that it had not occurred as a reason for sick leave in 2010 (28,1%), 104 answered that it had occurred 1 time (24,6%), 52 answered 2 times (12,3%), 28 answered 3 times (6,6%), 11 answered 4 times (2,6%) and 6 answered that it occurred 5 times (1,4%). There were 12 that answered that infections occurred above 5 times in 2010 (2,8%) while 18 did not know. (4,3%). The numbers are illustrated in figure 5.19 below.

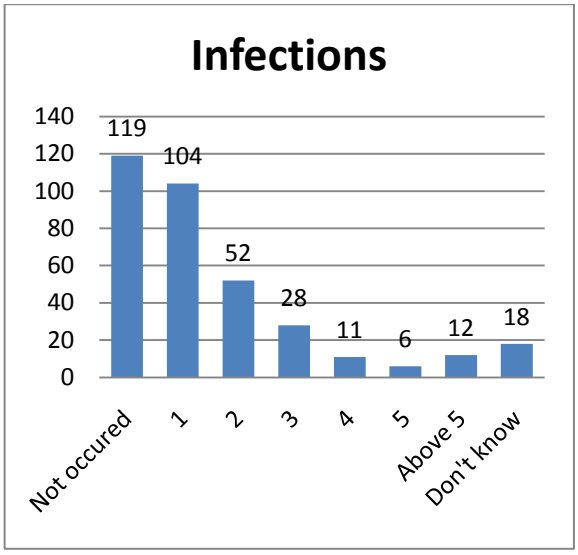

Figure 5.18: Infections – number of respondents per times occurred. n=350

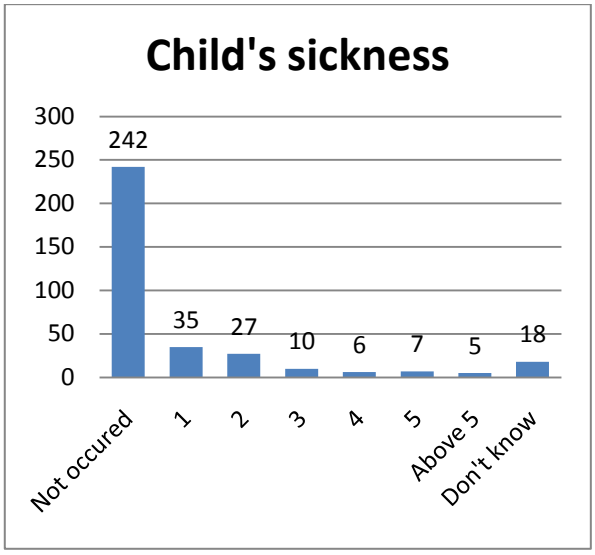

Figure 5.19: Child's sickness – number of respondents per time occurred. n=350

The fourth section concerned child's sickness as a reason for sick leave. 242 answered that it had not occurred (57,2%), 25 stated that it had occurred 1 time (8,3%), 27 answered 2 times (6,4%), 10 answered 3 times (2,4%), 6 answered 4 times (1,4%) while 7 answered 5 times (1,7%). There were 5 that answered that it had occurred above 5 times (1,2%) while 18 answered that they did not know (4,3%.) The numbers are illustrated in figure 5.20 above.

The last section in question 13.2 concerns other reasons for sick leave. 197 answered that there was no other reasons for sick leave in 2010 (46,6%), 62 answered that it had occurred 1 time (14,7%), 32 answered 2 times (7,6%), 6 answered 3 times (1,4%), 6 answered 4 times (1,4%) and 6 answered 5 times (1,4%). 8 answered that it had occurred above 5 times (1,9%) while there were 33 that answered that they did not know (7,8%) The numbers are illustrated in figure 5.21 below.

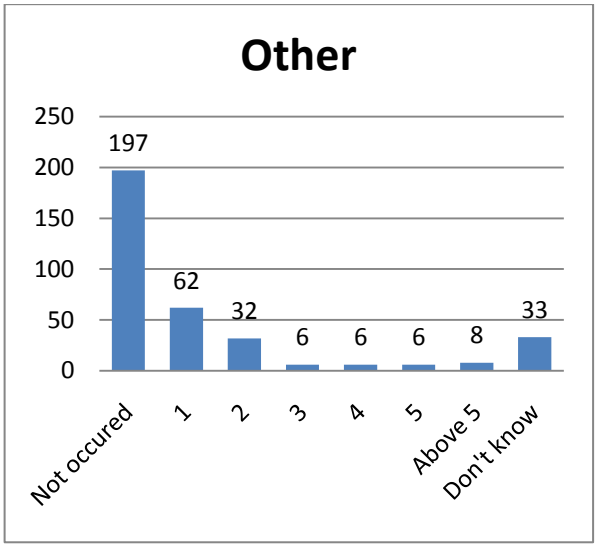

Figure 5.20: Other – number of respondents per times occurred. n=350

Figure 5.22 provides an overview over the five different reasons for sick leave explained above and shows the division. It is important to notice that this overview does not show the full division between the reasons for sick leave due to the option *Above 5*. It is though believed that it may give a snapshot of the approximate division. The reason which had the largest impact on the level of sick leave is infections (33,1%), followed by work related fatigue (20,8%), other reasons not covered in this thesis (18,6%), child's sickness (15,7%) and work related physical injury (11,9%).

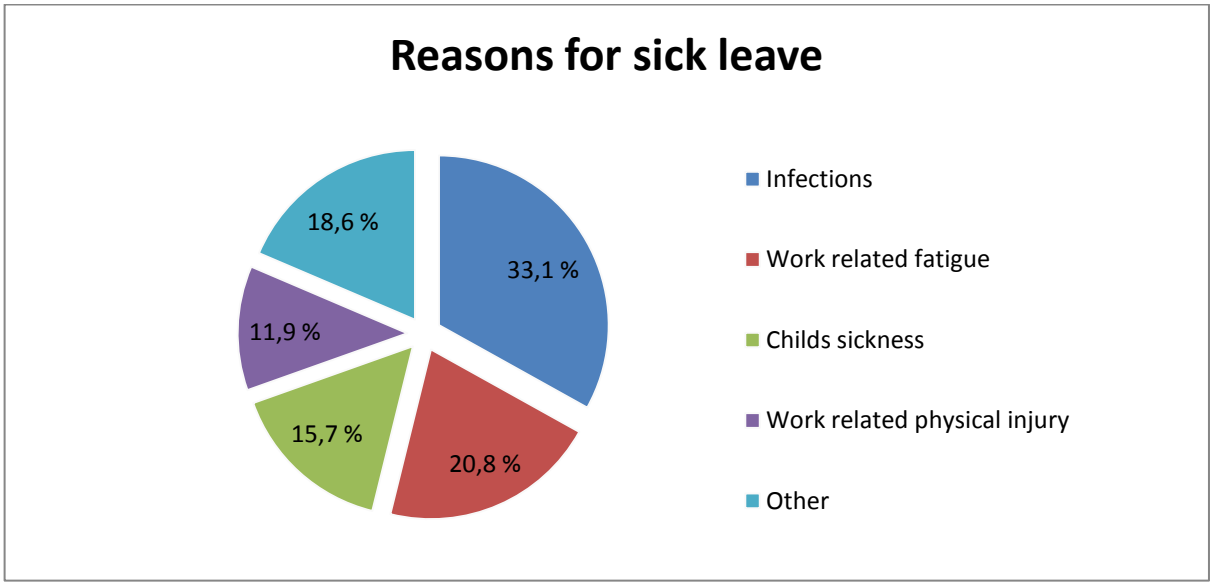

Figure 5.21: Reasons for sick leave – percentage

5.3.13 General statistics

Table 5.3 gives an overview of general statistics in comparison to different individual and work related characteristics. It is given to ease the analysis and discussion in chapter 7.0 covering the conclusion. The number in the table shows the average age, years in SAS and children per category of employees.

	Age	Years in SAS	Children
Gender			
Male	40,87	14,76	0,66
Female	44,33	18,02	1,22
Position fraction			
28-40%	28,50	3,83	0,17
60 %	44,64	18,27	1,79
80 %	45,66	19,26	1,47
100 %	45,10	18,65	0,76
Group			
Fixed	41,77	15,50	0,95
Variable	47,08	20,88	1,43
Route			
Short-haul	43,54	17,26	1,56
Long-haul	44,94	18,91	0,26
Position			
AP	50,42	25,21	1,09
AS	42,58	15,92	1,08
AH	40,16	13,39	1,16
Children			
Yes	43,94	17,66	-
No	43,71	17,44	-
Average	43,76	17,49	1,13

Table 5.3: General statistics

5.4 Work related factors

The fourth part of descriptive statistics is the work related factors and sentences. The answer rate was 100% as the questions were compulsory.

The respondent rated 34 factors according to the extent they affected their general work day in 2010 and was asked to finish 3 sentences. The descriptive statistics is shown in the tables below and the factors are divided into six groups; check in/checkout, work duration, routing, traffic schedule, work characteristics and passenger's characteristics. This does not represent the division done in the survey, but the factors are categorized due to their natural cohesion. Each group is presented in table 5.4-5.9 below. The measurements that describe the factors are n, missing, mean, std.dev, std.error, median and mode. The measure n is the sample size of the observed subset of a population, and represents those who answered either *Negative, Partially negative, No affect, Partially positive* or *Positive* when asked to rate the factors according to how they affect their general work day in 2010. *Missing* represents those who answered *Not relevant* or *Don't know*. According to Newbold, Carlson and Thorne (2010), the mean is defined as "the sum of the data values divided by the number of observations" which in the case of the factors is the average value between N*egative, Partially negative, No affect, Partially positive and Positive*. *Negative* has value 1, *No affect have* the value 3 and *Positive* the value 5. As an example, the variable *Check out 09:00-17:00* have a mean value of 4,40 meaning that the average of the respondents thought that the variable affected them in a partially positive way.

The median is defined as "the middle observation of a set of observations that are arranges in increasing (or decreasing) order" (Newbold, Carlson and Thorne, 2010). Mode on the other hand is the most frequently occurring value and may not always be present. From the example above the mode is 5, meaning that the majority of the respondents answered that check out between 09:00 and 17:00 was positive.

Factors – Check in / check out	n	Missing	Mean	Std. dev	Std. error	Median	Mode	
Check in 00:00-08:00	416	7	2,02	1,079	0,05	2,0	2,0	
Check in 08:00-16:00	414	9	3,92	1,017	0,05	4,0	5,0	
Check in 16:00-24:00	413	10	3,66	1,152	0,06	4,0	3,0	*
Check out 09:00-17:00	414	9	4,40	0,896	0,04	5,0	5,0	
Check out 17:00-01:00	412	11	2,94	1,107	0,06	3,0	2,0	
Check out 01:00-09:00	401	22	1,76	1,078	0,05	1,0	1,0	

Table 5.4: Factors – Check in / checkout. *More than one mode, this is the smallest one

Factors – Work duration	n	Missing	Mean	Std. dev	Std. error	Median	Mode
Breaks over 3 hours	420	3	2,18	0,983	0,05	2,0	2,0
Breaks under 3 hours	420	3	3,46	0,943	0,05	3,0	3,0
Block time over 3 hours	400	23	3,01	1,017	0,05	3,0	3,0
Block time under 3 hours	400	23	3,45	0,911	0,05	3,0	3,0
Work day over 8 hours	419	4	2,24	0,913	0,05	2,0	2,0

Table 5.5: Factors – Work duration

Factors - Routing	n	Missing	Mean	Std. dev	Std. error	Median	Mode
Daytrip	413	10	2,65	1,369	0,07	3,0	1,0
2-day route	417	6	3,78	1,211	0,06	4,0	5,0
3-day route	416	7	3,98	1,191	0,06	4,0	5,0
4-day route	389	34	3,26	1,596	0,08	4,0	5,0
5-day route	353	70	2,57	1,669	0,09	2,0	1,0

Table 5.6: Factors – Routing

Factors - Traffic schedule	n	Missing	Mean	Std. dev	Std. error	Median	Mode
Scheduled traffic	420	3	4,30	0,921	0,05	5,0	5,0
Charter traffic	418	5	2,90	1,347	0,07	3,0	2,0
Flights within Norway	416	7	3,91	1,027	0,05	4,0	5,0
Flights between Norway and Europe	414	9	4,10	0,982	0,05	4,0	5,0
Flights between OSL, CPH and ARN	412	11	3,42	1,202	0,06	3,0	3,0
Summer season	418	5	2,94	1,093	0,05	3,0	3,0
Winter season	416	7	3,42	0,936	0,05	3,0	3,0

Table 5.7: factors – Traffic schedule

Factors – Work characteristics	n	Missing	Mean	Std. dev	Std. error	Median	Mode
Fixed group	261	162	4,53	0,983	0,06	5,0	5,0
Variable group	330	93	2,30	1,425	0,08	2,0	1,0
Unpredictable work schedule	391	32	1,60	0,953	0,05	1,0	1,0
Aircraft CL (Classic)	407	16	2,59	1,273	0,06	2,0	3,0
Aircraft NG (Next Generation)	408	15	3,91	1,017	0,05	4,0	5,0
Colleagues	421	2	4,71	0,621	0,03	5,0	5,0
Often change of colleagues	417	6	2,35	1,108	0,05	2,0	2,0

Table 5.8: Factors – Work characteristics

Factors - Passenger characteristics	n	Missing	Mean	Std. dev	Std. error	Median	Mode
High load factor	421	2	3,78	1,064	0,05	4,0	5,0
Large Business/Extra	421	2	3,70	1,130	0,06	4,0	5,0
Large Economy	421	2	3,36	0,953	0,05	3,0	3,0
Passenger's nationality	403	20	3,38	0,814	0,04	3,0	3,0

Table 5.9: Factors – Passenger characteristics

The results of the sentences which the respondents were asked to finish and rate are presented in table 5.11. It is important to notice table 5.10 regarding the explanation of values since the sentences had different possible rating values.

Explanation of values for the sentences	Labels		
Value	1.	2.	3.
1	Disagree	too short	a negative degree
2	Partially disagree	partially too short	a partially negative degree
3	Either or	sufficient	no degree
4	Partially agree	partially too long	a partially positive degree
5	Agree	too long	a positive degree

Table 5.10: Explanation of values for the sentences

Factors - sentences		n	Missing	Mean	Std. dev	Std. error	Median	Mode
5.3.1.	Long days with few legs are better than short days with multiple legs	418	5	2,59	1,355	0,07	3,0	1,0
5.3.2.	My rest between work blocks are:	410	13	2,18	0,791	0,04	2,0	2,0
5.3.3.	Variation between early and late check-in in the same work block affects me in:	416	7	2,14	1,054	0,05	2,0	2,0

Table 5.11: Factors - sentences

6.0 Analysis and results

This chapter presents the analysis and results of testing the hypotheses based on the research questions presented in chapter 3. The opinions of cabin crew towards the work related factors are further analysed and presented, while the comments of the cabin crew are summarized at the end.

The analysis of the hypotheses done in this study is concerned around a 95% confidence level, but some of the results are significant on other levels, both lower and higher. When this occurred it is noted. A hypothesis is supported if the research has a significant result covariant with the content of the hypothesis. A hypothesis is partially supported if the variables presented in the research question have a significant relationship with the level of sick leave due to one of the reasons presented and not sick leave in total, while it will be rejected if not supported by the research.

Results in the tables regarding the independent T-tests that are denoted with a star (*) notes that equal variances is not assumed. When not denoted with a star, equal variance is assumed. When the means are discussed regarding sick leave and reasons for sick leave, it is important to note the coding of the questions. 1 means that it did not occur, 2 through 6 stands for the number of times it occurred minus 1, while 7 stands for *Above 5.*

6.1 Research questions

The research questions and hypotheses are developed with background in previous research presented in chapter 3.0. These were tested separately against sick leave. The focus will be placed on n, sig. and mean. N is the number of respondents to the question, mean is the average of the variable tested (presented in the title of each table) and sig. states if there is a significant relationship between the variables tested. The findings are significant if the sig. is less that 0,05 at the 95% confidence level.

6.1.1 Gender

$H_1$1: Females have a significant higher level of sick leave than males.

Table 6.1 shows that more females called in sick than males in percentage in 2010. The closer the mean is to 2, the more females called in sick. The reason for this is that males were coded as 1 and females as 2 in the survey. The mean of those who called in sick is 1,87 which means that there was a higher amount of females than males within the group who called in sick. $H_1$1 is supported and the result from previous research of NAV (2008), British Medical Journal (2008) and Moore (2001) is confirmed.

Gender*		**Group statistics**				**Independent sample T-test**			
Question	Answer	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Sick in 2010	Yes	350	1,87	0,341	0,018	2,942	81,572	0,004	0,175
	No	68	1,69	0,465	0,056				

Table 6.1: Gender* – Independent sample T-test. Mean: Explains "average" gender, 1=male, 2=female

To detail this finding even more, gender was ran against the number of sick leaves. The findings presented in table 6.2 shows then that there is no significant difference between the genders and the reasons for sick leave. Derived from this, one might say that more females called in sick than males in percentage, but that there is no significant difference between the genders when it comes to the amount of times they were sick. The males who called in sick were as often sick as the females who called in sick.

Gender		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total*	Male	44	3,80	3,475	0,524	1,110	48,510	0,273	0,599
	Female	275	3,20	2,171	0,131				
Injury	Male	43	1,56	1,385	0,211	0,480	327,0	0,632	0,093
	Female	286	1,47	1,153	0,068				
Fatigue*	Male	44	2,20	1,786	0,269	1,473	49,9	0,147	0,412
	Female	280	1,79	1,259	0,075				
Infections*	Male	43	2,12	1,276	0,195	-1,088	61,5	0,281	-0,233
	Female	289	2,35	1,529	0,090				
Child	Male	44	1,43	1,189	0,179	-1,07	330,0	0,284	-0,224
	Female	288	1,66	1,308	0,077				
Other	Male	22	1,82	1,498	0,226	0,221	315,0	0,825	0,049
	Female	273	1,77	1,343	0,081				

Table 6.2: Gender – Independent sample T-test. Mean: Number of sick leaves

6.1.2 Age

$H_1$2: The level of sick leave reported by cabin crew significantly increases with age

There is a significant relation between age and if cabin crew called in sick during 2010. Those who answered that they called in sick were on average 14% older than those who did not report any sick leave, shown in table 6.3. This result supports the hypothesis, but to further elaborate the finding, the research is extended to investigate if there is a significant correlation between age and the number of times called in sick.

Age*		**Group statistics**				**Independent sample T-test**			
Question	Answer	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Sick in 2010	Yes	350	44,23	7,792	0,416	2,231	80,793	0,028	3,093
	No	68	41,13	10,907	1,323				

Table 6.3: Age – Independent sample T-test. Mean: Age

A bivariate correlation test was conducted and reviled that age versus work related injury is significant with a weak positive relationship. This indicates that as age increases, so does the amount of reported injury. In addition, child`s sickness and age was significant with a weak negative relationship meaning that as ages increases, the fewer sick leaves are reported due to child's sickness. Sick leave due to other reasons not covered in the survey was also proved to have a significant correlation with age. The connection with age and child's sickness was even significant on the 99,9% confidence level, while the category *Other* was significant on the 99% confidence level The other three factors of sick leave were not significant. Table 6.4 show the bivariate correlation. The results of this test do not support the hypothesis since it proves that there is no connection between total reported sick leave and age.

Age		**Bivariate correlation**	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Age vs. total	319	-0,065	0,250
Age vs. injury	329	0,109	0,048
Age vs. work related fatigue	324	-0,067	0,228
Age vs. infections	332	0,015	0,789
Age vs. child's sickness	332	-0,197	0,000
Age vs. other	302	0,168	0,003

Table 6.4: Age – Bivariate correlation

To complement the research, cabin crew was further divided into two groups; younger and older. The first group represents those who were younger than 50 years old while the second group represent those who were 50 years and older, based on the findings by Statistics Norway (2010). As table 6.5 shows, there is a significant relationship between the two age groups and the level of sick leave with regards to the total number of times they have called in sick. Younger cabin crew called in sick 21,4% more often in 2010 than older cabin crew. As presented in the previous table, there is a significant relation between the age groups and sick leave due to child's sickness. The group *Younger* reported sick 64,2% more often because of child`s sickness.

Age > 49		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Younger	224	3,46	2,572	0,172	2,081	317,0	0,038	0,607
	Older	95	2,85	1,856	1,190				
Injury	Younger	229	1,44	1,101	0,073	-0,838	327,0	0,403	-0,119
	Older	100	1,56	1,358	0,136				
Fatigue	Younger	227	1,91	1,358	0,090	1,202	322,0	0,230	0,196
	Older	97	1,71	1,315	0,133				
Infections	Younger	232	2,31	1,452	0,095	-0,245	330,0	0,807	-0,044
	Older	100	2,35	1,610	0,161				
Child	Younger	233	1,84	1,458	0,096	4,792	330,0	0,000	0,720
	Older	99	1,12	0,500	0,050				
Other	Younger	222	1,82	1,436	0,096	0,784	315,0	0,434	0,131
	Older	95	1,68	1,178	0,121				

Table 6.5: Age > 49 – Independent sample T-test. Mean: Number of sick leaves

To sum up; those who called in sick during 2010 was on the average older than those who did not call in sick. But to complicate it; of those who called in sick, cabin crew younger than 50 years old had more sick leaves than those older than 50. Therefore the hypothesis is only partially supported and does thereby not support the previous research from Statistics Norway (2010).

6.1.3 Position fraction

$H_1$3: Cabin crew having a higher position fraction have a significantly higher level of sick leave than cabin crew with a lower position fraction.

To answer $H_1$3, position fraction was first divided into full time representing those who worked 100%, and part time representing those who worked 28%-40%, 60% and 80%. The results from the independent sample T-test is showed in table 6.6. Work related injury and work related fatigue was reported as the reason for sick leave 19,8% and 37,7% respectively more often by those working full time than those working part time. With regards to child's sickness, part time workers reported this as a reason for sick leave 50% more often than full time workers. There is no evidence that infections and the total number of times called in sick in the context of position fraction had a significant impact on the level of sick leave.

Position fraction		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Part time	181	3,19	2,299	0,171	-0,778	317,0	0,437	-0,211
	Full time	138	3,40	2,519	0,214				
Injury*	Part time	186	1,36	1,088	0,080	-2,009	276,7	0,046	-0,269
	Full time	143	1,63	1,287	0,108				
Fatigue*	Part time	185	1,59	1,060	0,078	-3,881	226,4	0,000	-0,605
	Full time	139	2,19	1,592	0,135				
Infections	Part time	187	2,36	1,501	0,110	0,612	330,0	0,541	0,102
	Full time	145	2,26	1,500	0,125				
Child*	Part time	188	1,90	1,513	0,110	4,963	297,0	0,000	0,640
	Full time	144	1,26	0,802	0,067				
Other	Part time	177	1,68	1,267	0,094	-1,443	315,0	0,150	-0,222
	Full time	140	1,90	1,471	0,124				

Table 6.6: Position fraction – Independent sample T-test. Mean: Number of sick leaves

To further investigate if position fraction had an impact on the level of sick leave, a one-way ANOVA test was conducted using the actual position fractions as showed in table 6.7. Now, the total number of times the cabin crew called in sick in the context of position fractions have a significant impact on the level of sick leave. Those working 80% and 100% called in sick more often then 28-40% and 60%. There is a significant connection between work related injuries and position fraction at the 90% confidence level, showing that sick leave due to injuries increases with position fraction. Position fraction and work

related fatigue still have a significant impact on sick leave on the 95% confidence level. The amount of sick leave due to fatigue increases with position fraction. Sick leave in the context of child`s sickness and position fraction is further significant at the 99,9% confidence level. Those working 60% and 80% calls in sick because of child`s sickness 31,9% and 15,3% respectively more often than the average.

Position fraction	**Group statistics**				**One-way ANOVA**			
Characteristics	n	Mean	Std. dev	Std. error	F	df	Sig	Mean square
Position fraction vs. total								
28-40%	16	1,56	0,892	0,223	2,996	3,0	0,031	16,866
60 %	65	3,26	2,210	0,274				
80 %	100	3,40	2,420	0,242				
100 %	138	3,40	2,519	0,214				
Sum	319	3,28	2,395	0,134				
Position fraction vs. injury								
28-40%	16	1,06	0,250	0,063	2,252	3,0	0,082	3,123
60 %	64	1,25	0,854	0,107				
80 %	106	1,47	1,266	0,123				
100 %	143	1,63	1,287	0,108				
Sum	329	1,48	1,184	0,065				
Position fraction vs. fatigue								
28-40%	15	1,33	0,724	0,187	6,045	3,0	0,001	10,469
60 %	64	1,50	1,039	0,130				
80 %	106	1,68	1,109	0,108				
100 %	139	2,19	1,592	0,135				
Sum	324	1,85	1,346	0,075				
Position fraction vs. infections								
28-40%	16	1,94	0,574	0,143	0,935	3,0	0,424	2,103
60 %	66	2,26	1,396	0,172				
80 %	105	2,50	1,647	0,161				
100 %	145	2,26	1,500	0,125				
Sum	332	2,32	1,499	0,082				
Position fraction vs. child's sickness								
28-40%	16	1,00	0,000	0,000	10,989	3,0	0,000	16,857
60 %	68	2,15	1,499	0,182				
80 %	104	1,88	1,591	0,156				
100 %	144	1,26	0,802	0,067				
Sum	332	1,63	1,293	0,071				
Position fraction vs. other								
28-40%	16	1,63	1,500	0,375	1,468	3,0	0,223	2,715
60 %	61	1,48	0,849	0,109				
80 %	100	1,81	1,426	0,143				
100 %	140	1,90	1,471	0,124				
Sum	317	1,78	1,363	0,077				

Table 6.7: Position fraction – One-way ANOVA. Mean: Number of sick leaves due to the different reasons

This study found that position fraction does have an impact on the level of sick leave. There is significant positive relation between position fraction and total number of times they called in sick, sick leave due to work related injury and work related fatigue; a higher position fraction leads to increased sick leave due to these reasons. Child`s sickness have also a significant impact on the level of sick leave, but the relationship are a bit different since those working 60% have the highest sick leave due to children. The findings from Moland (2007) and $H_1$3 is supported since crew employed in a higher position fraction have a significant higher level of sick leave in total, due to fatigue and injury.

6.1.4 Children

$H_1$4: Cabin crew with children in their household have a significant higher level of sick leave than cabin crew without children in their household.

To check the hold of the fourth hypothesis the authors decided to divide the analysis into several levels. First, whether the respondent had children or not was tested against whether they were sick or not, second the number of children per household was tested against whether the respondent called in sick or not. Third the number of children was tested against the number of sick leaves and at last the age of the children was tested against the number of sick leaves.

Table 6.8 shows that cabin crew with children in their household during 2010 called in sick 12,5% more than those without children.

Sick leave		Children in household	
		Yes	No
Sick in 2010	Yes	87,6%	77,8%
	No	12,4%	22,2%
	Sum	100,0%	100,0%

Table 6.8: Sick leave in 2010 versus Children in household - Cross table

To further analyse if having children had an impact on the level of sick leave the authors looked at the connection between the number of children and the number of sick leave.

Table 6.9 shows that those who called in sick had significantly more children than those who did not call in sick.

Children (number)		**Group statistics**				**Independent sample T-test**			
Question	Answer	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Sick in 2010	Yes	350	1,18	1,122	0,060	2,318	416	0,021	0,342
	No	68	0,84	1,060	0,128				

Table 6.9: Children (number) – Independent sample T-test. Mean: Number of children

Table 6.10 shows the division between the number of sick leaves and whether they had children in their household or not. Having children in the household had a significant impact on the amount of sick leave the crew had due to fatigue and child's sickness. Sickness of children was significant on the 99,9% confidence level, Respondents without children in their household called in sick to Crew Control due to fatigue 18,5% more often than those with children.

Children (yes/no)		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	196	3,40	2,322	0,166	1,132	316,0	0,258	0,313
	No	122	3,09	2,513	0,227				
Injury	Yes	204	1,46	1,111	0,078	-0,231	326,0	0,818	-0,031
	No	124	1,49	1,297	0,116				
Fatigue*	Yes	202	1,73	1,221	0,086	-1,947	211,6	0,053	-0,317
	No	121	2,05	1,521	0,138				
Infections	Yes	205	2,31	1,472	0,103	-0,171	329,0	0,864	-0,029
	No	126	2,34	1,550	0,138				
Child*	Yes	205	2,01	1,523	0,106	9,541	204,0	0,000	1,015
	No	126	1,00	0,000	0,000				
Other	Yes	195	1,72	1,361	0,097	-1,001	314,0	0,318	-0,158
	No	121	1,88	1,370	0,125				

Table 6.10: Children (yes/no) – Independent sample T-test. Mean: Number of sick leaves

Table 6.11 supports the results above by testing sick leave against the number of children in a household. This table shows that there is a positive correlation between the number of children and the number of sick leaves taken due to child's sickness. It is correlated on the 99,9% confidence level. There is further a negative correlation between sick leave due

to fatigue and the number of children, meaning that those with fewer children in their household reported sick more often.

Children (number)		**Bivariate Correlation**	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Children in household vs. total	319	0,076	0,175
Children in household vs. injury	329	-0,030	-0,554
Children in household vs. fatigue	324	-0,136	0,014
Children in household vs. infections	332	-0,006	0,907
Children in household vs. child's sickness	332	0,401	0,000
Children in household vs. other	317	-0,700	0,216

Table 6.11: Children (number) – Bivariate Correlation

To further investigate the impact of having children in the household the age of the children was included in the analysis. A division between children younger and older than 12 years of age was made to sift out the age group having the largest impact. Table 6.12 and 6.13 shows the result from testing those who had children in the given age group against sick leave. Those without children between 0 and 12 had a significant higher degree of sick leave due to fatigue and other reasons not covered in this study than those with children younger than 12. They are 31,8% more often sick than their colleagues with children between 0 and 12. Those with children between 0 and 12 calls in sick due to sick children significantly more often than those without; they call in sick 140% more often. This is even significant on the 99,9% confidence level. When testing those with children aged above 12 against the rest, there were no significant results to report.

Children age 0-12 (yes/no)		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	116	3,53	2,216	0,206	-1,394	317,0	0,164	-0,388
	No	203	3,14	2,486	0,174				
Injury	Yes	121	1,40	0,971	0,088	0,844	327,0	0,400	0,114
	No	208	1,52	1,293	0,09				
Fatigue	Yes	121	1,54	0,913	0,083	3,263	322,0	0,001	0,497
	No	203	2,03	1,520	0,107				
Infections	Yes	122	2,39	1,468	0,133	-0,610	330,0	0,542	-0,104
	No	210	2,28	1,519	0,105				
Child	Yes	120	2,59	1,627	0,149	-12,35	330,0	0,000	-1,511
	No	212	1,08	0,549	0,038				
Other*	Yes	116	1,57	1,174	0,109	2,065	315,0	0,040	0,327
	No	201	1,90	1,451	0,102				

Table 6.12: Children age 0-12 (yes/no) – Independent sample T-test. Mean: Number of sick leaves

Children age > 12 (yes/no)		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	108	3,10	2,187	0,210	0,945	317,0	0,345	0,268
	No	211	3,37	2,495	0,175				
Injury	Yes	111	1,44	1,219	0,116	0,390	327,0	0,697	0,054
	No	218	1,50	1,169	0,079				
Fatigue	Yes	111	1,77	1,213	0,115	0,801	322,0	0,424	0,126
	No	213	1,89	1,412	0,097				
Infections	Yes	112	2,21	1,496	0,141	0,988	330,0	0,324	0,172
	No	220	2,38	1,501	0,101				
Child*	Yes	114	1,47	1,107	0,104	1,669	275,8	0,096	0,233
	No	218	1,71	1,377	0,093				
Other	Yes	107	1,75	1,325	0,128	0,264	315,0	0,792	0,043
	No	210	1,79	1,385	0,096				

Table 6.13: Children age > 12 (yes/no) – Independent sample T-test. Mean: Number of sick leaves

To further investigate the impact of having children between the age 0 and 12, the number of children was included. Table 6.14 shows once more that the number of children has a significant impact on sick leave due to fatigue and sickness of children. The correlation between the number of sick leaves due to fatigue and number of children shows that having more children led to fewer sick leaves, but the correlation is weak. Number of children versus sick leave due to child's sickness had on the other hand a moderate to strong positive correlation. At last, the number of children within the age group had a weak positive significant correlation on the total sick leave reported, meaning that having more children led to an increased level of sick leave.

Children age 0-12 (number)		Bivariate Correlation	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Age 0-12 vs. total	319	0,119	0,034
Age 0-12 vs. injury	329	-0,037	0,507
Age 0-12 vs. fatigue	324	-0,152	0,006
Age 0-12 vs. infections	332	0,021	0,701
Age 0-12 vs. child's sickness	332	0,582	0,000
Age 0-12 vs. other	317	-0,075	0,184

Table 6.14: children (number) – Bivariate Correlation

To further investigate if there was any difference within the age group and the effect on sick leave, the category between 0 and 12 years old was divided into three groups; 0-3, 4-7 and 8-12. The tables 6.15, 6.16 and 6.17 show the results from the tests. All three groups had significant impact on sick leave due to child's sickness, but the correlation is the strongest for children between the age 4 and 7. Sick leave due to fatigue is no longer significant correlated with the number of children on the 95% confidence level, but on the 90% level. It seems that the younger the children, the fewer sick leaves due to fatigue were reported.

Children age 0-3 (number)		**Bivariate Correlation**	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Age 0-3 vs. total	319	0,020	0,728
Age 0-3 vs. injury	329	-0,040	0,465
Age 0-3 vs. fatigue	324	-0,103	0,063
Age 0-3 vs. infection	332	0,072	0,192
Age 0-3 vs. child's sickness	332	0,314	0,000
Age 0-3 vs. other	317	-0,074	0,190

Table 6.15: Children (number) – Bivariate Correlation

Children age 4-7 (number)		**Bivariate Correlation**	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Age 4-7 vs. total	319	0,130	0,020
Age 4-7 vs. injury	329	-0,041	0,458
Age 4-7 vs. fatigue	324	-0,960	0,083
Age 4-7 vs. infections	332	0,017	0,764
Age 4-7 vs. child's sickness	332	0,433	0,000
Age 4-7 vs. other	317	0,000	1,000

Table 6.16: Children (number) – Bivariate Correlation

Children age 8-12 (number)		**Bivariate Correlation**	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Age 8-12 vs. total	319	0,065	0,246
Age 8-12 vs. injury	329	0,005	0,924
Age 8-12 vs. fatigue	324	-0,090	0,117
Age 8-12 vs. infection	332	-0,024	0,061
Age 8-12 vs. child's sickness	332	0,345	0,000
Age 8-12 vs. other	317	-0,081	0,148

Table 6.17: Children (number) – Bivariate Correlation

The research summed up supports the hypothesis by stating that children in household have a significant impact on the level of sick leave.

6.1.5 Marital status

$H_1$5: Marital status significantly affects the level of sick leave

To check if there was any hold in the fifth hypothesis, marital status was tested against the number of sick leave that cabin crew reported. Table 6.18 shows that fatigue was the only reason for sick leave that was significantly affected by marital status. Cabin crew living as cohabitants called in sick 20,5% more often than the average due to fatigue, while the single called in 9,2% more often than the average. Cabin crew who was married called in sick 11,4% less times than the average and 26,5% less than those living as cohabitant. This proves that marital status significantly affected sick leave with cohabitants and singles being the ones with the highest level of sick leave. This only applies for fatigue as a reason for sick leave and the hypothesis is therefore partially supported.

Marital status	Group statistics				One-way ANOVA			
Characteristics	n	Mean	Std. dev	Std. error	F	df	Sig	Mean square
Marital status vs. total								
Married	157	3,14	2,114	0,169	0,974	3,0	0,405	5,620
Cohabitant	78	3,58	2,840	0,322				
Single	67	3,42	2,518	0,308				
Other	15	2,67	2,225	0,575				
Sum	317	3,28	2,402	0,135				
Marital status vs. injury								
Married	163	1,55	1,343	0,105	1,094	3,0	0,352	1,533
Cohabitant	76	1,37	0,907	0,104				
Single	68	1,51	1,203	0,146				
Other	20	1,10	0,308	0,069				
Sum	327	1,47	1,185	0,066				
Marital status vs. fatigue								
Married	162	1,64	1,162	0,091	3,827	3,0	0,010	6,784
Cohabitant	75	2,23	1,640	0,189				
Single	66	2,02	1,342	0,165				
Other	19	1,63	1,300	0,298				
Sum	322	1,85	1,349	0,075				
Marital status vs. infections								
Married	164	2,46	1,568	0,122	0,948	3,0	0,418	2,135
Cohabitant	78	2,17	1,313	0,149				
Single	69	2,28	1,599	0,192				
Other	19	2,05	1,224	0,281				
Sum	330	2,33	1,500	0,083				
Marital status vs. child's sickness								
Married	166	1,74	1,452	0,113	0,881	3,0	0,451	1,482
Cohabitant	77	1,56	1,094	0,125				
Single	69	1,46	1,106	0,133				
Other	18	1,56	1,247	0,294				
Sum	330	1,63	1,296	0,071				
Marital status vs. other								
Married	157	1,66	1,264	0,101	1,125	3,0	0,339	2,094
Cohabitant	75	1,76	1,228	0,142				
Single	66	2,02	1,659	0,204				
Other	17	1,94	1,560	0,378				
Sum	315	1,77	1,365	0,077				

Table 6.18: Marital status – One-way ANOVA. Mean: Number of sick leaves due to the various reasons

6.1.6 Commuting and transport mode

$H_1$6a: Means of transport have a significant impact on the level of sick leave.

$H_1$6b: The use of a wide variety of means of transport has a significant impact on the level of sick leave.

$H_1$6c: Vicinity to base has a significant impact on the level of sick leave.

The transport modes were tested separately against sick leave. 1) Car versus sick leave showed no significant difference between the means, presented in table 6.19. 2) Boat had a significant effect on sick leave due to child's sickness on the 99,9% confidence level, but it is worth mentioning that there were only 5 that used boat as their main transport mode to and from work in 2010. Table 6.20 presents the results. 3) The total number of times called in sick versus bus was significant at 95% confidence level. This means that those who used the bus to and from work in 2010 called in sick 24,8% more often than those who did not use the bus, presented in 6.21. 4) The use of the Airport Express Train in the context of sick leave was further investigated. The only factor that had a significant impact was child`s sickness. Cabin crew who did not used the Airport Express Train called in sick 19,4% more often because of child`s sickness. The results are shown in table 6.22. 5) This thesis found no supporting evidence that the use of train had an impact on sick leave. Result from the independent sample T-test is presented in table 6.23. 6) The use of tram to and from work in 2010 had no significant impact on the level of sick leave for the cabin crew. The result is presented in table 6.24. 7) The use of the subway in the context of sick leave was further investigated and the result is presented in table 6.25. The only factor that had a significant impact was child`s sickness. The mean shows that those who did not use the subway called in sick 65% more often than those who used the subway as one the modes of transport to and from work. 8) The use of airplane to and from work in 2010 had no significant impact on the level of sick leave for the cabin crew, presented in table 6.26.

$H_1$6a is supported since commuting by boat, bus, the Airport Express Train and/or subway had a significant effect on the level of sick leave. The research proves that those using boat, the Airport Express Train and subway as their main transport mode had a lower level of sick leave in the context of child`s sickness than those who did not. Crew that used the bus called in sick more often than those who did not.

Means of transport - Car		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	176	3,29	2,273	0,171	-0,089	317,0	0,929	-0,024
	No	143	3,27	2,545	0,213				
Injury*	Yes	182	1,40	1,034	0,077	1,355	269,3	0,177	0,183
	No	147	1,58	1,344	0,111				
Fatigue*	Yes	181	1,76	1,194	0,089	1,265	265,3	0,207	0,196
	No	143	1,96	1,515	0,127				
Infections	Yes	183	2,27	1,429	0,106	0,693	330,0	0,489	0,115
	No	149	2,38	1,584	0,130				
Child	Yes	182	1,66	1,195	0,089	-0,590	330,0	0,553	-0,085
	No	150	1,58	1,406	0,115				
Other*	Yes	176	1,84	1,563	0,118	-0,986	307,3	0,325	-0,146
	No	141	1,70	1,062	0,089				

Table 6.19: Means of transport – Car – Impendent sample T-test. Mean: Number of sick leaves due to the various reasons

Means of transport - Boat		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	5	3,00	1,000	0,447	0,262	317,0	0,793	0,283
	No	314	3,28	2,411	0,136				
Injury	Yes	5	1,20	0,447	0,200	0,527	327,0	0,599	0,281
	No	324	1,48	1,192	0,066				
Fatigue	Yes	5	1,60	0,894	0,400	0,416	322,0	0,678	0,253
	No	319	1,85	1,353	0,076				
Infections	Yes	5	3,20	2,387	1,068	-1,325	330,0	0,186	-0,894
	No	327	2,31	1,483	0,082				
Child*	Yes	5	1,00	0,000	0,000	8,842	326,0	0,000	0,636
	No	327	1,64	1,301	0,072				
Other	Yes	5	1,80	0,837	0,374	-0,40	315,0	0,968	-0,024
	No	312	1,78	1,371	0,078				

Table 6.20: Means of transport – Boat – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

Means of transport - Bus		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total*	Yes	92	3,82	3,275	0,341	-2,071	116,5	0,041	-0,754
	No	227	3,06	1,894	0,126				
Injury*	Yes	97	1,62	1,357	0,138	-1,288	151,4	0,200	-0,200
	No	232	1,42	1,102	0,072				
Fatigue*	Yes	97	2,05	1,530	0,155	-1,642	153,6	0,103	-0,289
	No	227	1,76	1,254	0,083				
Infections	Yes	98	2,41	1,630	0,165	-0,698	330,0	0,485	-0,126
	No	234	2,28	1,443	0,094				
Child	Yes	98	1,62	1,418	0,143	0,037	330,0	0,971	0,006
	No	234	1,63	1,241	0,081				
Other	Yes	92	1,83	1,419	0,148	-0,418	315,0	0,677	-0,071
	No	225	1,76	1,342	0,089				

Table 6.21: Means of transport – Bus – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

Means of transport - Airport Express Train		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	115	3,05	2,395	0,223	1,271	317,0	0,205	0,355
	No	204	3,41	2,392	0,167				
Injury	Yes	115	1,52	1,238	0,115	-0,499	327,0	0,618	-0,068
	No	214	1,45	1,157	0,079				
Fatigue	Yes	110	1,84	1,338	0,128	0,119	322,0	0,906	0,019
	No	214	1,86	1,354	0,093				
Infections	Yes	115	2,36	1,585	0,148	-0,329	330,0	0,742	-0,057
	No	217	2,30	1,455	0,099				
Child*	Yes	115	1,44	1,078	0,100	2,034	285,8	0,043	0,280
	No	217	1,72	1,387	0,094				
Other	Yes	111	1,76	1,325	0,092	-0,333	315,0	0,739	-0,054
	No	206	1,76	1,325	0,092				

Table 6.22: Means of transport – Airport Express Train – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

Means of transport - Train		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	41	3,07	2,573	0,402	0,589	317,0	0,556	0,236
	No	278	3,31	2,371	0,142				
Injury*	Yes	42	1,67	1,633	0,252	-0,835	46,6	0,408	-0,217
	No	287	1,45	1,105	0,065				
Fatigue	Yes	38	1,92	1,383	0,224	-0,352	322,0	0,725	-0,082
	No	286	1,84	1,344	0,079				
Infections	Yes	43	2,23	1,571	0,240	0,406	330,0	0,685	0,100
	No	289	2,33	1,492	0,088				
Child	Yes	42	1,43	1,172	0,181	1,061	330,0	0,289	0,227
	No	290	1,66	1,309	0,077				
Other*	Yes	41	2,12	1,763	0,275	-1,389	46,6	0,172	-0,397
	No	276	1,72	1,289	0,078				

Table 6.23: Means of transport – Train – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

Means of transport - Tram		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	6	4,00	3,225	1,317	-0,744	317,0	0,457	-0,735
	No	313	3,27	2,381	0,135				
Injury	Yes	6	1,17	0,408	0,167	0,648	327,0	0,518	0,316
	No	323	1,48	1,193	0,066				
Fatigue	Yes	6	1,67	0,816	0,333	0,334	322,0	0,739	0,186
	No	318	1,85	1,355	0,076				
Infections	Yes	6	2,67	1,366	0,558	-0,572	330,0	0,568	-0,354
	No	326	2,31	1,503	0,083				
Child	Yes	6	1,50	1,225	0,500	0,241	330,0	0,809	0,129
	No	326	1,63	1,296	0,072				
Other	Yes	6	2,50	2,345	0,957	-1,315	315,0	0,189	-0,738
	No	311	1,76	1,340	0,076				

Table 6.24: Means of transport – Tram – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

Means of transport - Subway		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	10	2,50	1,509	0,477	1,045	317,0	0,297	0,804
	No	309	3,30	2,416	0,137				
Injury	Yes	10	1,50	1,269	0,401	-0,062	327,0	0,951	-0,240
	No	319	1,48	1,184	0,066				
Fatigue*	Yes	9	2,78	1,986	0,662	-1,434	8,2	0,188	-0,956
	No	315	1,82	1,319	0,074				
Infections	Yes	10	2,50	1,841	0,582	-0,387	330,0	0,699	-0,186
	No	322	2,31	1,491	0,083				
Child*	Yes	10	1,00	0,000	0,000	8,858	321	0,000	0,646
	No	322	1,65	1,309	0,073				
Other	Yes	10	1,30	0,675	0,213	1,123	315,0	0,262	0,492
	No	307	1,79	1,378	0,079				

Table 6.25: Means of transport – Subway – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

Means of transport - Airplane		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Yes	30	3,10	2,171	0,396	0,430	317	0,668	0,198
	No	289	3,30	2,420	0,142				
Injury	Yes	34	1,65	1,300	0,223	-0,883	327	0,378	-0,189
	No	295	1,46	1,171	0,068				
Fatigue	Yes	31	1,94	1,569	0,282	-0,377	322	0,707	-0,096
	No	293	1,84	1,323	0,077				
Infections	Yes	35	2,54	1,482	0,251	-0,933	330	0,352	-0,250
	No	297	2,29	1,502	0,087				
Child*	Yes	35	2,09	1,772	0,299	-1,668	37,9	0,104	-0,513
	No	297	1,57	1,217	0,071				
Other	Yes	30	1,87	1,332	0,243	-0,382	315,0	0,703	-0,100
	No	287	1,77	1,368	0,081				

Table 6.26: Means of transport – Airplane– Independent sample T-test. Mean: Number of sick leaves due to the various reasons

The transport modes were divided into private and public. The reason for the division is that there may be a difference in the nature of transport modes. Here, car considered as private whilst bus, boat, tram, train, airport express train, airplane and subway are considered as public transport. When testing private and public means of transport, none of the factors of sick leave were significant as table 6.27 illustrates. There is no significant relationship between public and private transport and sick leave.

Means of transport		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Private	176	3,29	2,273	0,171	0,080	317,0	0,929	0,024
	Public	143	3,27	2,545	0,213				
Injury*	Private	182	1,40	1,034	0,077	-1,355	269,3	0,177	-0,183
	Public	147	1,58	1,344	0,111				
Fatigue*	Private	181	1,76	1,194	0,089	-1,265	265,3	0,207	-0,196
	Public	143	1,96	1,515	0,127				
Infections	Private	183	2,27	1,429	0,106	-0,693	330,0	0,489	-0,115
	Public	149	2,38	1,584	0,130				
Child	Private	182	1,66	1,195	0,089	0,594	330,0	0,553	0,085
	Public	150	1,58	1,406	0,115				
Other*	Private	176	1,84	1,563	0,118	0,986	307,3	0,325	0,146
	Public	141	1,70	1,062	0,089				

Table 6.27: Means of transport – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

When further investigating if commuting and transport modes have an impact on the level of sick leave, the authors looked at the sum of means of transport versus if they called in sick or not during 2010. Sum of transport is the number of the different means of transport each respondent used to and from work in 2010, shown in table 6.28. $H_1$6b is rejected as sum of means of transport had no significant impact on the level of sick leave.

Means of transport (number)		Group statistics				Independent sample T-test			
Question	Answer	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Sick in 2010	Yes	350	1,50	0,725	0,039	-1,025	416,0	0,306	-0,100
	No	68	1,60	0,794	0,096				

Table 6.28: Means of transport (sum) – Independent sample T-test. Mean: Number of means of transport

The correlation between sum of means of transport and sick leave, presented in table 6.29, reviles further that none of the factors had a significant impact on sick leave on the 99,5% significant level. There is though a weak connection between the sum of means of transport and other reasons for sick leave not covered by this thesis on the 90% confidence level

Means of transport (number)		Bivariate correlation	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Means of transport vs. total	319	0,007	0,903
Means of transport vs. injury	329	0,052	0,349
Means of transport vs. fatigue	324	0,039	0,487
Means of transport vs. infections	332	0,049	0,369
Means of transport vs. child's sickness	332	-0,050	0,367
Means of transport vs. other	317	0,101	0,073

Table 6.29: Means of transport – Bivariate Correlation

In addition to analyse if transport modes had an impact on sick leave, the study will investigate if the distance from the county where the cabin crew lived to their base had an impact. Vicinity to base is divided into near or far away. Near indicates that the crew which had OSL as their base lived in either Oslo or Akershus, crew with SVG as their base lived in Rogaland and that crew with TRD as their base lived in either Nord- and Sør-Trønderlag. There is no evidence that vicinity to base had a significant impact on sick leave, showed in table 6.30. $H_1$6c is therefore rejected.

Vicinity to base		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total*	Away	80	2,99	1,650	0,184	-1,561	214,9	0,120	-0,389
	Near	239	3,38	2,593	0,168				
Injury*	Away	84	1,62	1,388	0,151	1,140	121,1	0,256	0,190
	Near	245	1,43	1,105	0,071				
Fatigue	Away	82	1,90	1,487	0,164	0,417	322,0	0,677	0,072
	Near	242	1,83	1,298	0,083				
Infections	Away	86	2,31	1,391	0,150	-0,038	330,0	0,970	-0,007
	Near	246	2,32	1,538	0,098				
Child*	Away	84	1,80	1,495	0,163	1,269	122,3	0,207	0,229
	Near	248	1,57	1,215	0,070				
Other	Away	80	1,75	1,268	0,142	-0,197	315,0	0,844	-0,035
	Near	237	1,78	1,396	0,091				

Table 6.30: Vicinity to base – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

6.1.7 Base

$H_1$7: Base has a significant effect on the level of sick leave.

$H_1$7 is rejected as there are no significant relationship between base and sick leave. One reason for why there is no significant result may be that the bases TRD and SVG are too small to give a statistical correct picture of the situation. The results are presented in table 6.31.

Base	**Group statistics**				**One-way ANOVA**			
Characteristics	n	Mean	Std. dev	Std. error	F	Df	Sig	Mean square
Base vs. total								
OSL	273	3,33	2,471	0,150	0,968	2,0	0,381	5,552
TRD	24	2,63	1,469	0,300				
SVG	22	3,32	2,212	0,472				
Sum	319	3,28	2,395	0,134				
Base vs. injury								
OSL	284	1,50	1,211	0,072	0,970	2,0	0,380	1,361
TRD	25	1,16	0,473	0,095				
SVG	20	1,50	1,395	0,312				
Sum	329	1,48	1,184	0,065				
Base vs. fatigue								
OSL	277	1,87	1,402	0,084	0,326	2,0	0,722	0,594
TRD	26	1,69	1,011	0,198				
SVG	21	1,71	0,902	0,197				
Sum	324	1,85	1,346	0,075				
Base vs. infections								
OSL	285	2,36	1,512	0,090	0,824	2,0	0,440	1,854
TRD	25	2,20	1,633	0,327				
SVG	22	1,95	1,133	0,242				
Sum	332	2,32	1,499	0,082				
Base vs. child's sickness								
OSL	284	1,60	1,259	0,075	1,774	2,0	0,171	2,954
TRD	26	2,08	1,695	0,332				
SVG	22	1,50	1,144	0,244				
Sum	332	1,63	1,293	0,071				
Base vs. other								
OSL	269	1,78	1,347	0,082	0,353	2,0	0,703	0,658
TRD	26	1,92	1,647	0,323				
SVG	22	1,59	1,221	0,260				
Sum	317	1,78	1,363	0,077				

Table 6.31: Base – One-way ANOVA. Mean: Number of sick leaves due to the various reasons

6.1.8 Group

$H_1$8: Group has a significant effect on the level of sick leave.

The only reason for sick leave that was significantly affected by group was fatigue, presented in table 6.32. Those employed in the variable group reported fatigue as a reason for sick leave 22,6% more often than those in the fixed group. This means that $H_1$8 is partially supported by this research since not all sick leaves have a significant effect.

Group		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Variable	185	3,34	2,480	0,182	0,343	312,0	0,732	0,095
	Fixed	129	3,24	2,311	0,203				
Injury	Variable	188	1,51	1,213	0,088	0,819	322,0	0,414	0,106
	Fixed	136	1,40	1,064	0,091				
Fatigue*	Variable	184	2,01	1,458	0,107	2,372	317,0	0,018	0,361
	Fixed	135	1,64	1,168	0,101				
Infections	Variable	188	2,19	1,446	0,105	-1,434	325,0	0,152	-0,233
	Fixed	179	2,42	1,459	0,124				
Child	Variable	188	1,52	1,213	0,088	-1,694	325,0	0,091	-0,239
	Fixed	139	1,76	1,329	0,113				
Other	Variable	185	1,83	1,363	0,100	1,110	310,0	0,268	0,171
	Fixed	127	1,66	1,298	0,115				

Table 6.32: Group – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

6.1.9 Routes

$H_1$9: There is a significant difference in the level of sick leave for cabin crew operating long- and short-haul and short-haul only.

The was a significant relation between the level of sick leave due to other reasons and routes operated on the 95% confidence level. Those flying long-haul and short-haul reported this to be a reason 27,8% more often than those flying short-haul only. Fatigue had a significant relationship with routes on the 90% confidence level. Those working short- and long-haul reported fatigue 20,1% more often than those working short-haul

only. Table 6.33 presents the results and the term long-haul represents those who operate both long- and short-haul. The hypothesis is therefore partially supported.

Routes		**Group statistics**				**Independent sample T-test**			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	Long-haul	52	3,67	2,778	0,385	1,293	312,0	0,197	0,471
	Short-haul	262	3,20	2,316	0,143				
Injury	Long-haul	53	1,68	1,312	0,180	1,290	321,0	0,198	0,231
	Short-haul	270	1,45	1,168	0,071				
Fatigue	Long-haul	54	2,15	1,547	0,210	1,814	316,0	0,071	0,360
	Short-haul	264	1,79	1,282	0,079				
Infections	Long-haul	53	2,26	1,483	0,204	-0,098	324,0	0,922	-0,022
	Short-haul	273	2,29	1,462	0,089				
Child	Long-haul	53	1,60	1,419	0,195	-0,080	324,0	0,936	-0,015
	Short-haul	273	1,62	1,240	0,075				
Other	Long-haul	51	2,16	1,629	0,228	2,278	309,0	0,023	0,465
	Short-haul	260	1,69	1,266	0,079				

Table 6.33: Routes – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

6.1.10 Years employed

$H_1$10: Number of years employed as cabin crew in SAS has a significant effect on the level of sick leave.

To check if there was any hold in $H_1$10, the number of years the respondents reported to have been employed as cabin crew in SAS was tested against whether they were sick or not and the number of sick leaves. Table 6.34 shows that there is a strong significant relation between the number of years employed and whether the crew was sick or not. Those who called in sick had worked 25,9% longer than those not calling in sick. The hypothesis is therefore supported by this research.

Years employed*		**Group statistics**				**Independent sample T-test**			
Question	Answer	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Sick in 2010	Yes	347	18,03	8,212	0,441	2,835	84,8	0,006	3,724
	No	68	14,31	10,203	1,237				

Table 6.34: Years in SAS – Independent sample T-test. Mean: years employed as cabin crew in SAS

Table 6.35 shows the results when testing the number of sick leaves against number of years employed in SAS. The only reason that is significantly correlated with years employed is child's sickness. It states that there is a weak negative correlation, meaning that those working in SAS for a longer time reported fewer sick leaves due to child's sickness. This is valid on the 99,9% confidence level.

Years employed		**Bivariate correlation**	
Characteristics	N	Pearsons Correlated	Sig. (2-tailed)
Years in SAS vs. total	316	-0,024	0,675
Years in SAS vs. injury	327	0,084	0,127
Years in SAS vs. fatigue	322	0,072	0,200
Years in SAS vs. infections	330	0,044	0,429
Years in SAS vs. child's sickness	330	-0,201	0,000
Years in SAS vs. other	315	-0,056	0,321

Table 6.35: Years employed in SAS – Bivariate correlation

These two tests shows that the number of years employed in SAS have a significant effect on whether cabin crew calls in sick or not, but it also proves that there is no correlation between the number of years worked and the number of times crew called in sick.

6.1.11 Position

$H_1$11: Position has a significant effect on the level of sick leave.

When investigating if position had an impact on the level of sick leave, the positions were first divided into two groups; AP and AS/AH. The reason for the division is that AS and AH has primarily the same tasks and responsibilities onboard short-haul flights. Table 6.36 show that there is a significant relation between total number of times called in sick and AP and AS/AH. Those working as AS/AH called in sick 24,6% more often that those working as AP. There is also a significant relation between sick leave due to child's sickness and position. Those working as AS/AH called in sick 42,2% more often than AP. Further there is a relationship between sick leave due to fatigue and other reasons for sick leave, and position on the 90% confidence level. AS/AH reported fatigue and *Other* as reasons for sick leave 16,8% and 17,5% more often than AP, respectively.

Position		Group statistics				Independent sample T-test			
Reason	Characteristics	n	Mean	Std. dev	Std. error	t	df	Sig. (2-tailed)	Mean difference
Total	AP	116	2,84	1,846	0,171	-2,517	317,0	0,012	-0,696
	AS/AH	203	3,54	2,629	0,185				
Injury	AP	119	1,47	1,192	0,109	-0,076	327,0	0,939	-0,010
	AS/AH	210	1,48	1,183	0,082				
Fatigue	AP	119	1,67	1,249	0,115	-1,804	322,0	0,072	-0,279
	AS/AH	205	1,95	1,392	0,097				
Infections	AP	121	2,20	1,520	0,138	-1,113	330,0	0,266	-0,190
	AS/AH	211	2,39	1,487	0,102				
Child*	AP	121	1,28	0,839	0,076	-4,312	329,9	0,000	-0,544
	AS/AH	211	1,82	1,458	0,100				
Other*	AP	115	1,60	1,099	0,102	-1,887	294,2	0,060	-0,276
	AS/AH	202	1,88	1,486	0,105				

Table 6.36: Position – Independent sample T-test. Mean: Number of sick leaves due to the various reasons

The one-way ANOVA test was conducted to further investigate the impact of the three different positions separately. In total, AS called in sick 29,7%more often than AH in 2010, and 35,6% more often than the total average. As table 5.37 shows, cabin crew working as AS called in sick because of fatigue more often than AH and AP. Further, crew working as AH had a 14,1% higher level of sick leave than the average because of child's sickness. At last crew working as AH called in sick due to other reasons of sick leave not covered in this study 12,5% more than AP's and 18,4% more often than AS'. The result of the hypothesis remains unchanged from the research presented in table 6.37.

Position	Group statistics				One-way ANOVA			
Characteristics	n	Mean	Std. dev	Std. error	F	df	Sig	Mean square
Position vs. total								
AP	116	2,84	1,846	0,171	4,860	2	0,008	27,218
AS	20	4,45	3,776	0,844				
AH	183	3,43	2,466	0,182				
Sum	319	3,28	2,395	0,134				
Position vs. injury								
AP	119	1,47	1,192	0,109	0,161	2	0,852	0,227
AS	21	1,62	1,359	0,297				
AH	189	1,47	1,165	0,085				
Sum	329	1,48	1,184	0,065				
Position vs. fatigue								
AP	119	1,67	1,249	0,115	5,042	2	0,007	8,917
AS	21	2,67	1,853	0,404				
AH	184	1,87	1,312	0,097				
Sum	324	1,85	1,346	0,075				
Position vs. infections								
AP	121	2,20	1,520	0,138	1,570	2	0,210	3,518
AS	20	1,95	1,468	0,328				
AH	191	2,43	1,485	0,107				
Sum	332	2,32	1,499	0,082				
Position vs. child's sickness								
AP	121	1,28	0,839	0,076	7,961	2	0,000	12,780
AS	21	1,48	0,981	0,214				
AH	190	1,86	1,499	0,109				
Sum	332	1,63	1,293	0,071				
Position vs. other								
AP	115	1,60	1,099	0,102	4,235	2,0	0,015	7,710
AS	21	1,52	1,861	0,406				
AH	181	1,80	1,424	0,106				
Sum	317	1,78	1,363	0,077				

Table 6.37: Position – One-way ANOVA. Mean: Number of sick leaves due to the various reasons

$H_1$11 is supported as the total number called in sick, fatigue, child`s sickness and the category *Other* are significant related to position.

6.2 Regression

The dependent variables in this regression analysis are how many times the crew called in sick during 2010. This includes the reasons for sick leave. The independent variables are the variables believed to have an impact on the sick leave.

A model summary from the regression analysis will be presented for each of the reasons for sick leave. The *R* presents the correlation between the actual score on the dependent variable and the predicted scores based on the regression equation (Kirkpatrick, Feenly 2011). The *R Squared* is a measure between 0 and 1 that explains how much one factor can predict another. When *R Squared* is 1 it means that the independent variables will perfectly explain the dependent variable. In addition to the model summary, unstandardized and standardized coefficients will be presented. The unstandarized coefficients *B* explains how many times (more or less than) an independent variable has occurred compared to the constant. The standardized coefficients *Beta* is used to compare the different variables. *Sig* shows if or how much the variable contributes to predict the dependent variable. If the value of *Sig* if less than 0,05 than the variable is making a significant contribution.

6.2.1 Total number of sick leave

In the case of the total number of times called in sick, the *R Squared* is 0,094. This indicates that 9,4% of the total number of times called in sick is explained by position fraction, position, commuting by bus and gender as shown in table 6.38. The variable that has the highest effect is the position fraction 28-40% as shown by *B*. Crew working this fraction calls in sick 2,022 fewer times than those working 60%, 80% and 100%. It further shows that those positioned as AP's have 0,88 times fewer sick leaves than both AS and AH. Those commuting by the bus have 0,721 more sick leaves, and females have 0,813 fewer sick leaves than males.

Number of sick leaves		Model summary		Unstandardized coefficients		Standardized coefficients		
Variables	Description	R Square	Adjusted R square	B	Std. Error	Beta	t	Sig.
Summary		0,094	0,082					
(Constant)				4,206	0,369		11,392	0,000
Position fraction	(False/28-40%)			-2,022	0,485	-0,236	-4,168	0,000
Position	(AS+AH/AP)			-0,880	0,280	-0,174	-3,139	0,002
Bus	(No/Yes)			0,721	0,282	0,139	2,560	0,011
Gender	(Male/Female)			-0,813	0,359	-0,126	-2,266	0,024

Table 6.38: Number of sick leaves – Regression

6.2.2 Work related injury

When running the regression analysis with the dependent variable work related injury, the only factor that was significant was position fraction which explains 1,3% of the sick leave caused by injury. This is showed by the *R Square* from the model summary being 0,013. Those working full time had 0,269 more sick leaves due to injury than those working part time. The results are presented in table 6.39.

Injury		Model summary		Unstandardized coefficients		Standardized coefficients		
Variables	Description	R Square	Adjusted R square	B	Std. Error	Beta	t	Sig.
Summary		0,013	0,010					
(Constant)				1,360	0,086		15,740	0,000
Position fraction	(Part/Full)			0,269	0,131	0,113	2,053	0,041

Table 6.39: Injury – Regression

6.2.3 Work related fatigue

The next dependent variable was work related fatigue. Here, 12,6% of the sick leave caused by fatigue is explained by position fraction, marital status, children, position and commuting. The one with the biggest impact is commuting by subway. Those who used the subway as their main transport mode was 0,891 times more sick that those who did not. This is followed by position fraction where crew employed in the resource pool were 0,764 times less sick while crew working 100% had 0,345 more sick leaves due to fatigue. The analysis proved that those who have children between 0-12 of age in their household had less sick leave due to fatigue then those with older children. Crew living as

cohabitants were 0,451 times more often sick. AP's was 0,437 less sick than AS and AH. The results are presented in table 6.40.

Fatigue		Model summary		Unstandardized coefficients		Standardized coefficients		
Variables	Description	R Square	Adjusted R square	B	Std. Error	Beta	t	Sig.
Summary		0,126	0,109					
(Constant)				1,972	0,164		12,019	0,000
Position fraction	(False/100%)			0,345	0,163	0,126	2,117	0,035
Cohabitant	(No/Yes)			0,451	0,171	0,144	2,641	0,009
Children 0-12	(No/Yes)			-0,523	0,170	-0,187	-3,076	0,002
Position	(False/AP)			-0,437	0,162	-0,154	-2,696	0,007
Position fraction	(False/28-40%)			-0,764	0,292	-0,158	-2,618	0,009
Subway	(No/Yes)			0,891	0,424	0,114	2,101	0,036

Table 6.40: Fatigue – Regression

6.2.4 Infection

The regression analysis with Infections as the dependent variable gave no result. This means that none of the independent variables tested could explain sick leave due to infections when tested together.

6.2.5 Child's sickness

The only factor significantly affecting sick leave caused by child`s sickness was whether the crew had children between the age 0 and 12 or not. 31,6% of the sick leave can be explained by children between 0 and 12 years as the *R Square* is 0,316. Those with children within this age group reported to be sick due to child's sickness 1,512 times more than those without children within this age group. The results are presented in table 6.41.

Child's sickness		Model summary		Unstandardized coefficients		Standardized coefficients		
Variables	Description	R Square	Adjusted R square	B	Std. Error	Beta	t	Sig.
Summary		0,316	0,314					
(Constant)				1,080	0,074		14,538	0,000
Children 0-12	(No/Yes)			1,512	0,124	0,562	12,239	0,000

Table 6.41: Child's sickness – Regression

6.2.6 Other

The reason for sick leave named *Other* is included since it may contain reasons not covered by the categories presented above. The model summary shows that 3,4% of the sick leave in 2010 was caused by position and children. The independent variables that explains the sick leave was position and children between the ages of 0 and 12. Crew positioned as AS had 0,838 times more sick leave due to other reasons than those working as AP or AH. Crew with children between the ages 0 and 12 reported *Other* as the reason for sick leave 0,313 times less than those without children in the category. The results are presented in table 6.42.

Other		Model summary		Unstandardized coefficients		Standardized coefficients		
Variables	Description	R Square	Adjusted R square	B	Std. Error	Beta	t	Sig.
Summary		0,034	0,027					
(Constant)				1,842	0,098		18,858	0,000
Position	(False/AS)			0,838	0,330	0,142	2,541	0,012
Children 0-12	(No/Yes)			-0,313	0,159	-0,110	-1,971	0,050

Table 6.42: Other - Regression

6.3 Work related factors

The results of the work related factors and sentences presented in section 3.3 are graphical illustrated in figure 6.1 through 6.8. Figure 6.1 gives a complete overview of all the factors rated by the cabin crew, while figure 6.2 through 6.7 gives an overview according to category. This way of presentation is chosen since it first may give a better overview of which factors that was rated as the most negative and positive within the work day of cabin crew, while it second may give an overview of the factors within the different categories.

Figure 6.1 shows that the factors which are noted as negative, according to both mode and mean, are *Check in 00:00-08:00, Check out 17:00-01:00, Check out 01:00-09:00, Breaks over 3 hours, Work days over 8 hours, Daytrip, 5-day route, Charter traffic, Variable group, Unpredictable work schedule* and *Often change of Colleagues.* Variables noted as less negative, but still negative, are S*ummer season* and *Aircraft CL (Classic).* Out of these factors, *Unpredictable work schedule* proves to be the factor that affects the general work day of cabin crew in SAS most negatively.

Figure 6.1 shows further that the factors which are noted as positive, according to both mode and mean, are *Check in 08:00-16:00, Check out 09:00-17:00, 2-day route, 3-day route, Scheduled traffic, Flights within Norway, Flights between Norway and Europe, Fixed group, Aircraft NG (Next Generation), Colleagues, High load factor* and *Large Business/economy Extra.* The factors with the highest positive effect on the general work day of cabin crew in SAS is *Fixed group* and *Colleagues*.

When it comes to the sentences presented in figure 6.8, long days with few legs are viewed as having almost the same impact as shorter days with multiple legs. The rest between work blocks is viewed as partially too short while variation between early and late check-in in the same work block affects the cabin crew in partially negative degree.

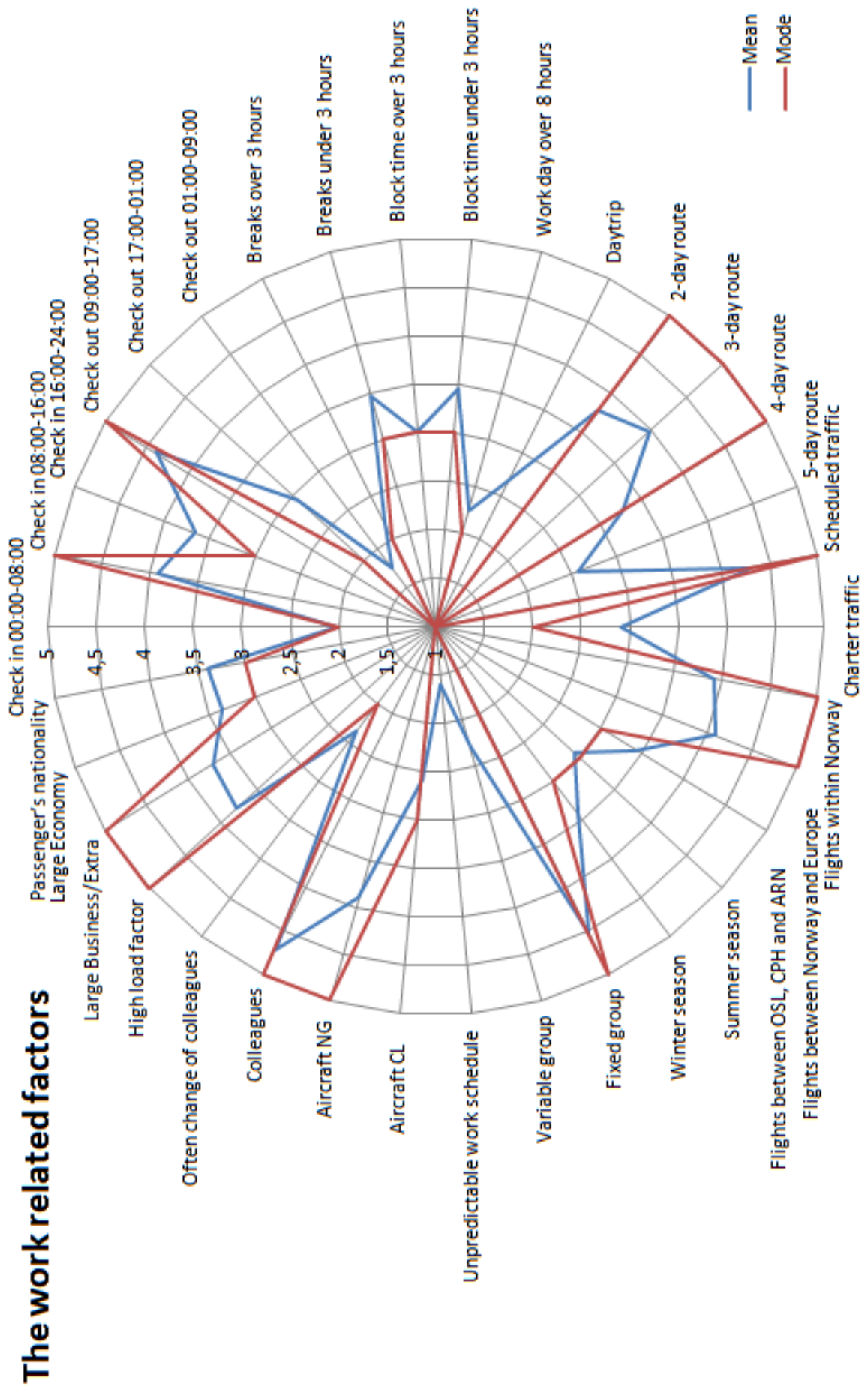

Figure 6.1: The work related factors

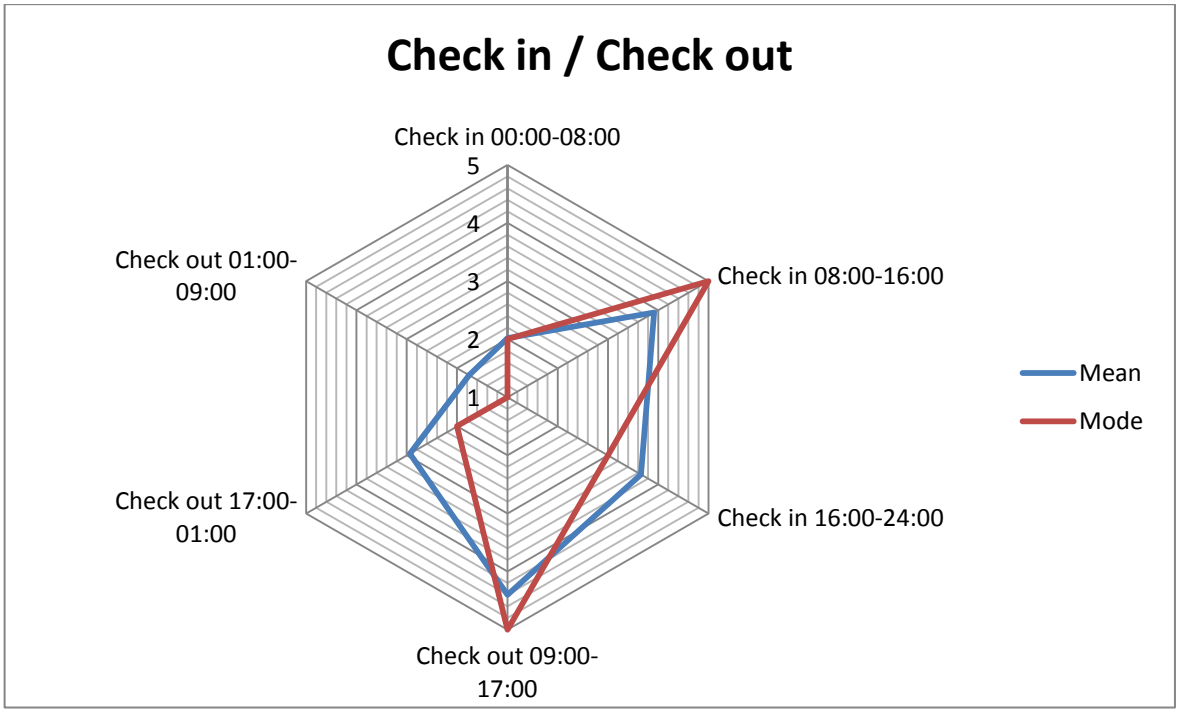

Figure 6.2: Presentation of work related factors - Check in / Check out

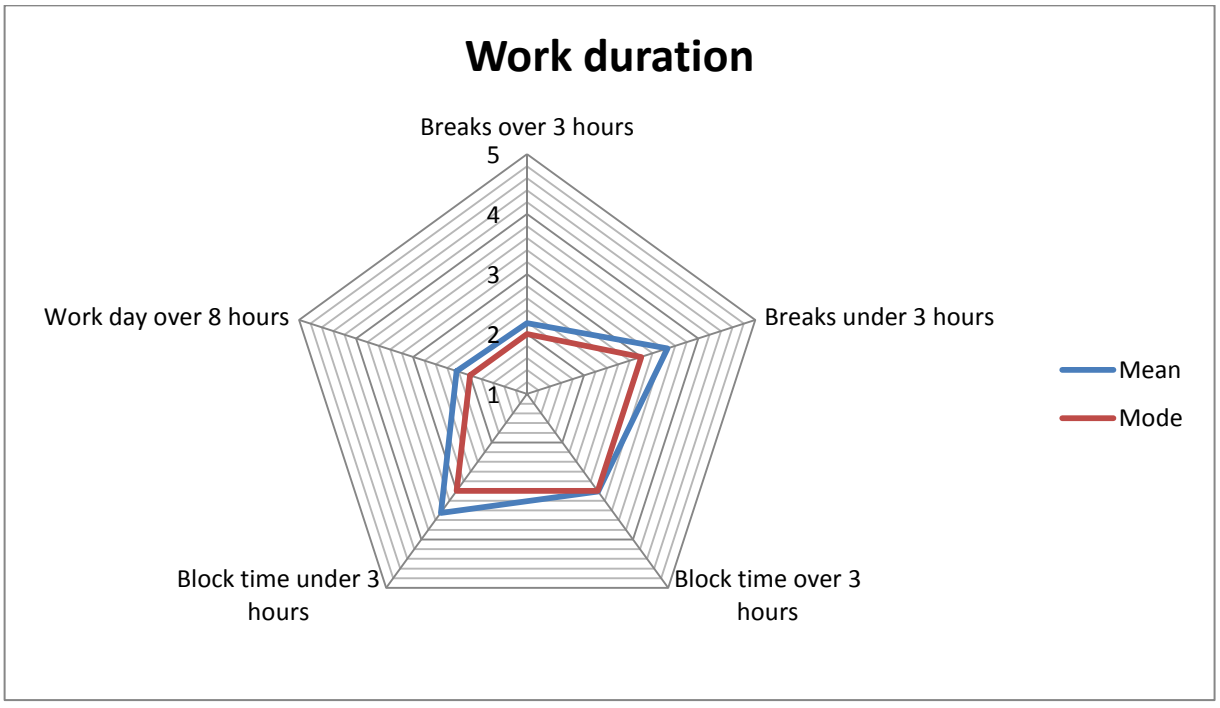

Figure 6.3: Presentation of work related factors - Work duration

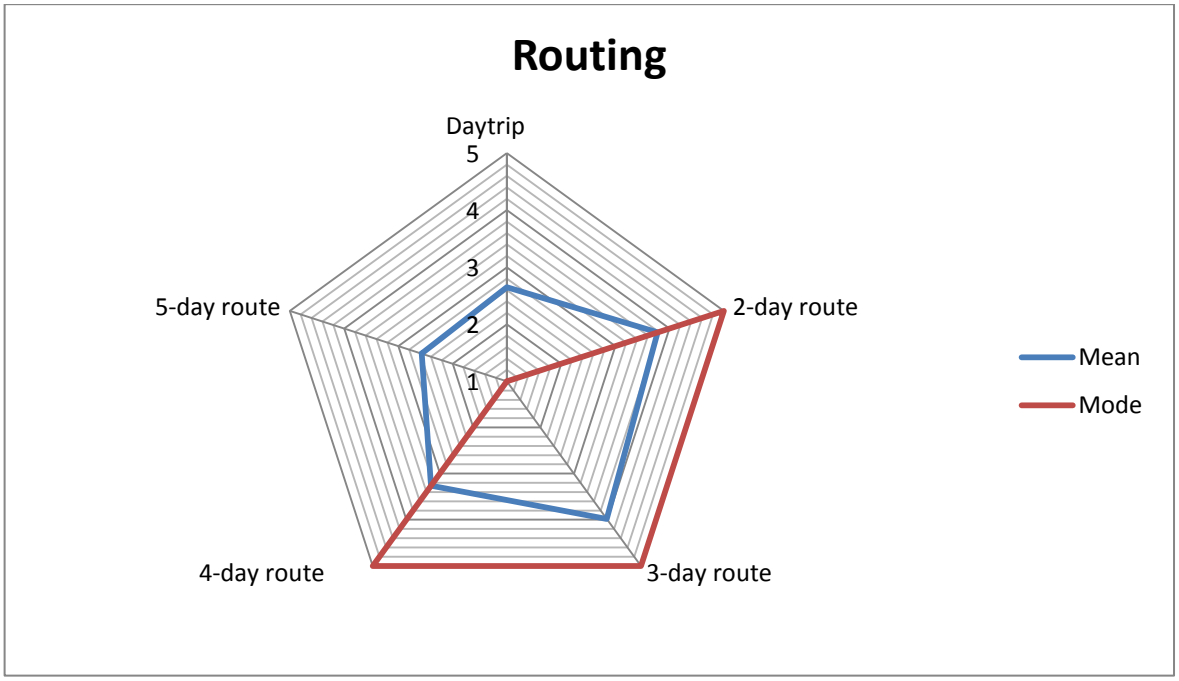

Figure 6.4: Presentation of work related factors – Routing

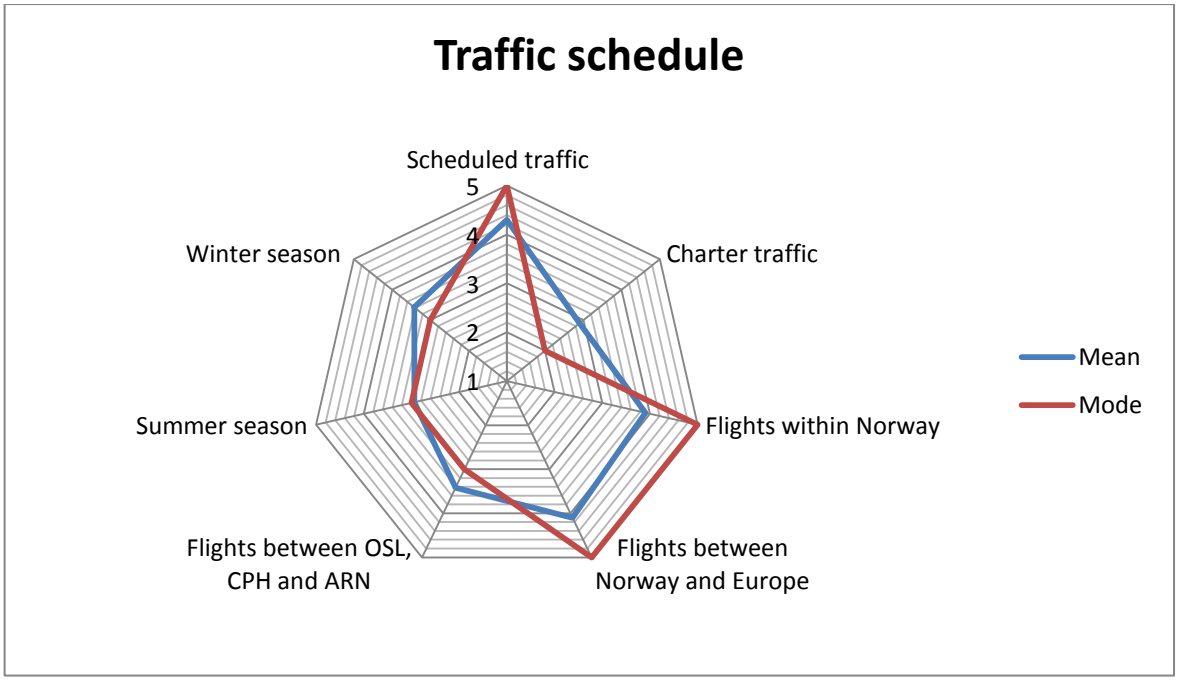

Figure 6.5: Presentation of work related factors - Traffic schedule

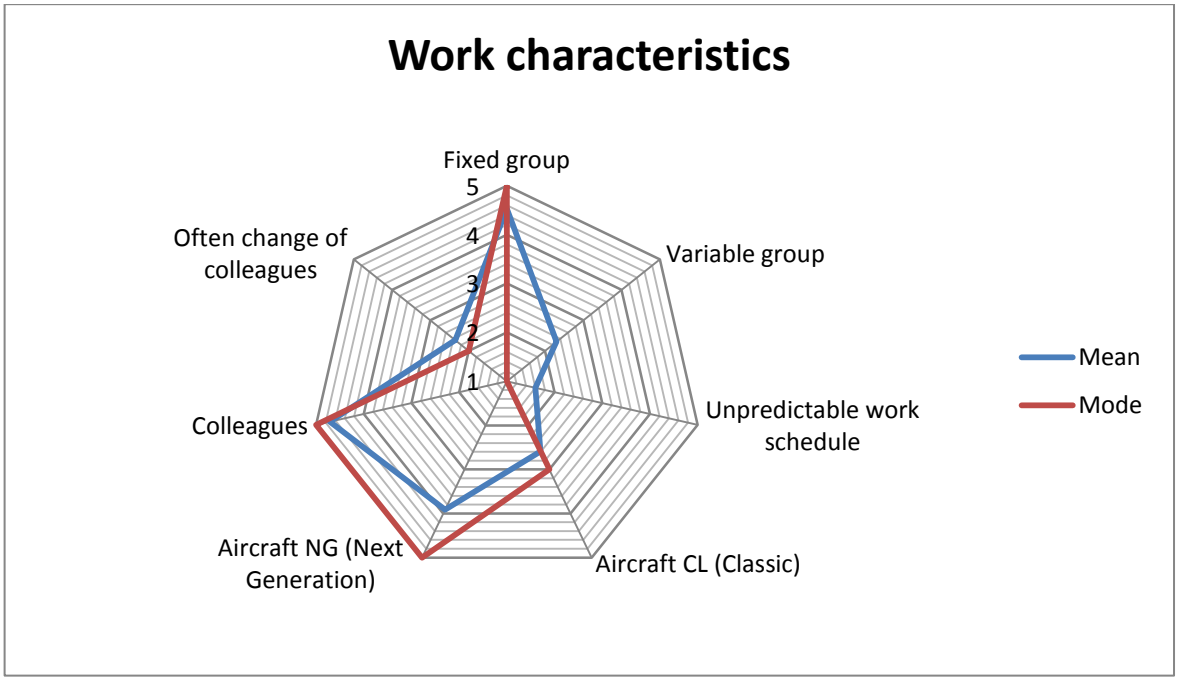

Figure 6.6: Presentation of work related factors - Work characteristics

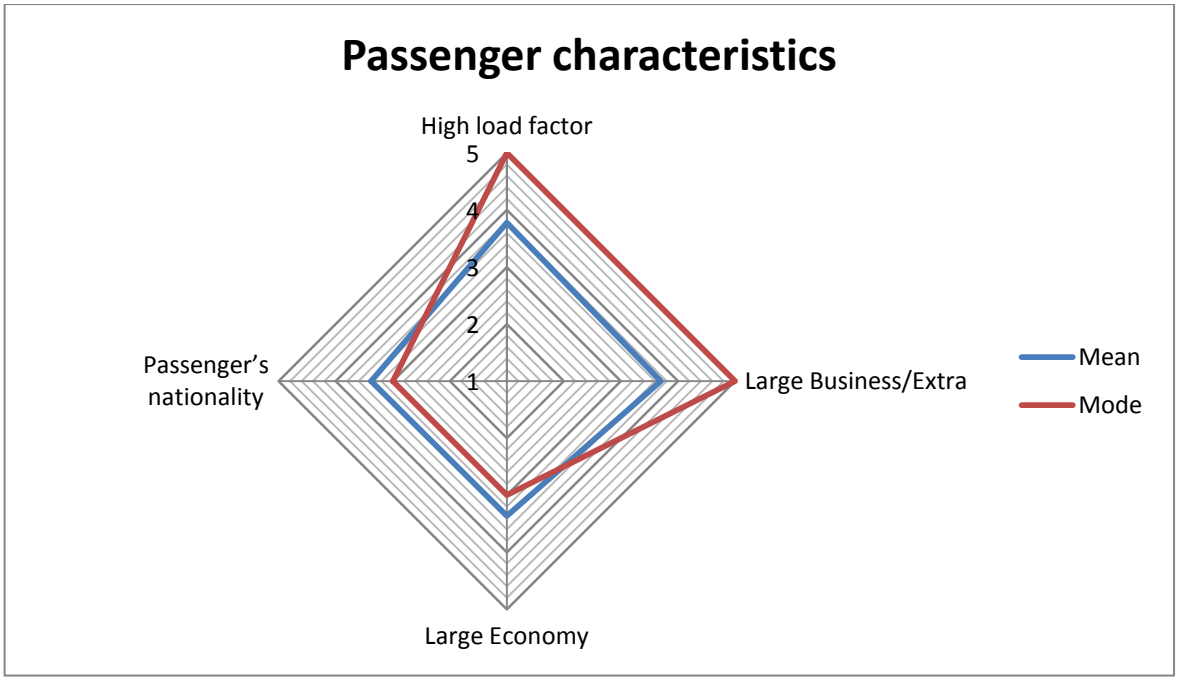

Figure 6.7: Presentation of work related factors - Passenger characteristics

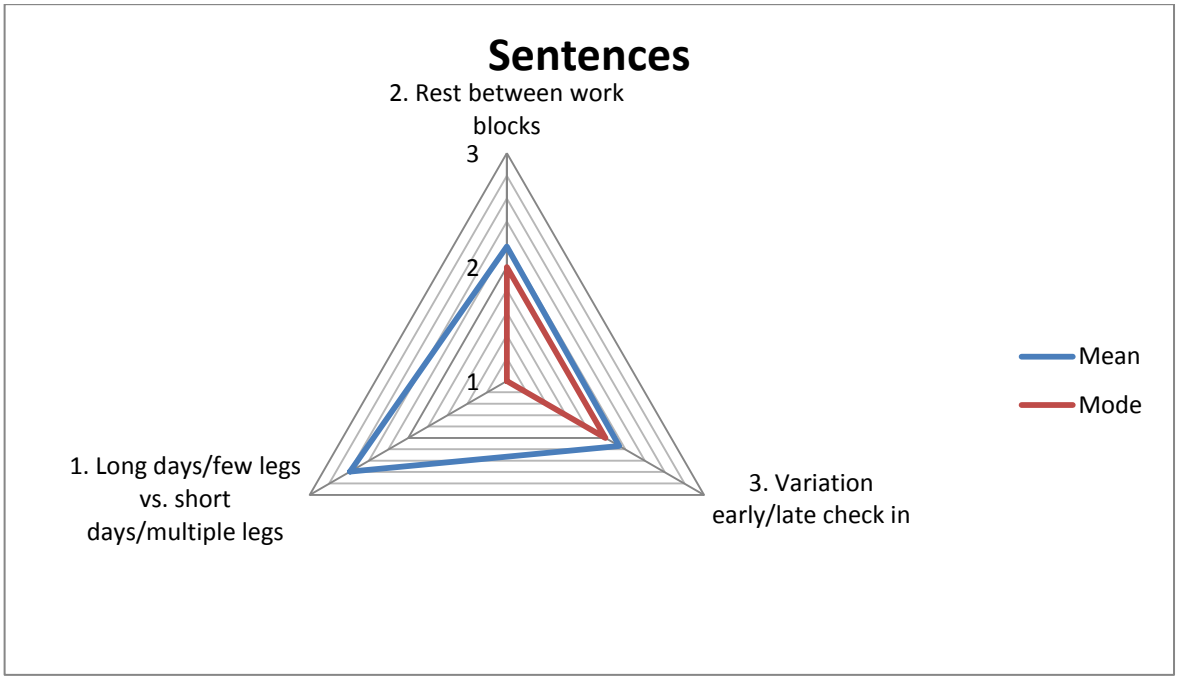

Figure 6.8: Presentation of work related factors - Sentences

6.4 Comments

239 of 423 respondents (56,5%) chose to give a comment at the end of the survey. After a read through, the authors were able to categorize them into three different topics; work environment, scheduling and management. There is a range of comments further categorized underneath these main topics and they will be addressed in a decreasing order based on the amount of comments. Positive and negative comments related to the work factors are not included since these are already uncovered in the section 6.3.

6.4.1 Work environment

The work environment for cabin crew is mainly concerned around the aircraft. Before departure, during the flight and after arrival the crew have many different tasks concerning the aircraft, security control, passenger observation and so on (appendix 2). When organizing the comments retrieved from the survey there were many that concerned the work environment. The two main subjects were physical work environment and change of airplanes and will be explained below.

1. Physical work environment - according to the comments, physical work environment concerns the aircraft and the equipment onboard. Some of the crew

was negative towards the narrow aisle on certain aircrafts where they need to bring trolleys up and down, passing each other and passengers. Further, poor equipment such as cabinet doors, wheals on trolleys and lack of hand luggage space was repeatedly commented on. Further, some of the crew mentioned that the lack of a standardised fleet of aircrafts was negative. The crew have different opinions towards different types of aircrafts and some noted that the type of machine they were scheduled to operate had a negative effect on their workday.

2. Change of airplanes - another factor that was frequently commented on was the fact that changing from one aircraft to another was time consuming. In addition to the types CL and NG, many also commented that changing airplane on short routes had a negative effect on their day.

6.4.2 Scheduling

This section refers to comments regarding scheduling of cabin crew.

1. Predictability – it was commented that there was low or no predictability regarding impending work blocks, making it hard to plan anything ahead. This was said to negatively affect family, friends and social life. Late release of the roster was by some mentioned as an influencing factor on this issue. Another issue mentioned which influenced the low predictability was the long feedback time on applications regarding days off. Crew commented that one usually did not get any feedback until just before the time off applied for was to start.

2. PBS – the bidding system was said not to work properly and to be unpredictable in the execution.

3. Distribution of routes – long and short routes was commented to be unfair distributed amongst cabin crew and bases.

4. Days off / spare time – it was commented that crew have too few days off and to little spare time between work blocks. The rest time between blocks was also said

to be affected by late check out on the last day of work and early check in the first day of a new block. The lack of opportunity to influence their days off was furthermore mentioned as having a negative impact on their work day. The lack of special days off, days which crew by themselves could administer and distribute throughout the year was desired. Another issue emphasised was that the days off was poorly distributed for those working part time, appearing in clusters. Many commented that their life now was concerned around SAS since they felt that they spent too much time on work.

5. Work during weekends – many commented that there was too few weekends off during the year, not giving them the chance to have a social life with those having jobs in other businesses.

6. Stops – the lack of stops outside Norway was mentioned as having a negative impact on their work day. The crew explained that they missed “stops of welfare”. Poor distribution of stops amongst cabin crew and bases was further mentioned.

7. Use of standby – extensive use of standby was mentioned by the crew as having a negative effect on their work day

6.4.3 Management

Many of the comments concerned the management and the lack of communication and the feeling of not being heard.

1. Poor management - several crew members commented on poor management. The common denominator was that they felt not to be heard when speaking their mind. Also the rumours about possible acquisitions and merges without receiving any clear updated information were perceived as mentally stressful.

7.0 Conclusion

This chapter presents the main findings of the study, the main implications, the limitations and the recommendations for further research on the topic of sick leave.

A set of research question and hypotheses was developed through literature and interaction with the industry, a survey was conducted to collect necessary data and the hold of the hypotheses was tested separately by analysing the data gathered. The data collected were then tested in a stepwise multiple regression analysis which showed what characteristics that affects the level of sick leave when testing the characteristics altogether. In addition to the hypotheses the work related factors was developed and rated by cabin crew according to how the factors affected their general work day, from negative to positive. At last, in the survey the crew had the opportunity to write comments. Many took advantage of this opportunity and the comments were systematized into categories.

7.1 Main findings

This study aimed to support SAS in Norway regarding their work with the level of sick leave in the company. The main objectives was to 1) uncover individual and work related characteristics that have a significant impact on the level of reported sick leave, and 2) uncover the opinions of employees towards work related factors.

7.1.1 Research questions

As table 7.1 shows, some of the hypotheses developed were rejected as there were no statistical data that significantly supported them. Seven of the hypotheses were supported while three of them were partially supported. The term *partially supported* are used for the hypotheses were the characteristics did not have an impact on the total level of sick leave, but on the reasons for sick leave. The direction concerning if the characteristics lead to an increased or decreased level of sick leave is discussed in 7.2.

Hypothesis	Description	Result
$H_1$1	Gender	Supported
$H_1$2	Age	Supported
$H_1$3	Position fraction	Supported
$H_1$4	Children in household	Supported
$H_1$5	Marital status	Partially supported
$H_1$6a	Means of transport	Supported
$H_1$6b	Means of transport (number)	Rejected
$H_1$6c	Residence, Base	Rejected
$H_1$7	Base	Rejected
$H_1$8	Group	Partially supported
$H_1$9	Routes	Partially supported
$H_1$10	Years employed	Supported
$H_1$11	Position	Supported

Table 7.1: Summary of the results of testing the hypotheses

7.1.2 Regression

Table 7.2 presents a summary of the results found when running a multiple regression analysis of the individual and work related characteristics. A positive direction means that cabin crew characterised by the variable had less sick leave than others, while a negative direction means the opposite; that they had increased sick leave.

Type of sick leave	Variable	Description	Direction
Total sick leave	Position fraction	28-40%	Positive
	Position	AP	Positive
	Commuting	Bus	Negative
	Gender	Female	Positive
Injury	Position fraction	Full time	Negative
Fatigue	Position fraction	100%	Negative
		28-40%	Positive
	Marital status	Cohabitant	Negative
	Children	Age 0-12	Positive
	Commuting	Subway	Negative
	Position	AP	Positive
Infections	-	-	-
Child's sickness	Children	Age 0-12	Negative
Other	Position	AS	Negative
	Children	Age 0-12	Positive

Table 7.2: Summary of regression analysis

7.1.3 Work related factors

Table 7.3 shows a summary of the work related factors. They are ranked according to the responses from the cabin crew and are divided into negative and positive. E.g. colleagues were the most positive while unpredictable work schedule was the most negative factor.

Rank	Positive	Negative
1	Colleagues	Unpredictable work schedule
2	Fixed Group	Check out 01:00-09:00
3	Check out 09:00-17:00	Variable group
4	Scheduled traffic	5-day route
5	Flights between Europe and Norway	Day trip
6	3-day route	Check in 00:00-08:00
7	Check in 08:00-16:00	Breaks over 3 hours
8	Aircraft NG (Next Generation)	Work days over 8 hours
9	Flights within Norway	Often change of colleagues
10	2-day route	Check out 17:00-01:00
11	High load factor	Often change of colleagues
12	Large Business/Economy Extra	
13	4-day route	

Table 7.3: Summary of work related factors

The sentences, presented in figure 6.8, were included in the analysis of the work related factors to further research the opinion of cabin crew. The results show that there was no particular difference between working long days with few legs and short days with multiple legs. The rest between work blocks was further viewed as partially too short, while variation between early and late check-in in the same work block affects the cabin crew in partially negative degree.

7.1.4 Comments

The comments were systemized by the authors into three main categories and ten subcategories representing the subjects that were most commented on. In general the comments were negatively charged with opinions on what should/could be improved by SAS. Section 6.4 contains a more detailed explanation of the categories.

Category	Description
Work environment	Physical work environment
	Change of airplanes
Scheduling	Predictability
	PBS
	Distribution of routes
	Days off /spare time
	Work during weekends
	Stops
	Use of standby
Management	Poor administration

Table 7.4: Summary of comments

7.2 Main implications

The main implications involve a discussion of the results and their effect on SAS and cabin crew. The main implications are sorted after the reasons for sick leave as they are viewed as the most important division throughout the thesis. The individual and work related characteristics affecting the level of sick leave are not listed according to importance or effect in this section, but rather in accordance to the order which they are presented throughout the thesis. Results significant on the 90% level and above are included in this conclusion. Due to the uncertainty of the method used for regression-analysis the conclusion is first and foremost dependent on the results obtained when running the individual and work related characteristics separately.

7.2.1 Sick or not

A total of 82,7% of the respondents called in sick during 2010, and the research performed shows that of those calling in sick, the largest part in percentage was females. Age had further an impact, proving that there was a connection between increased age and if the respondent were sick; those who were sick were on the average older than those not sick. This positive connection was also found for the amount of children in household and years employed as cabin crew. The respondents answering that they had sick leave during 2010 had on average more children in their household and had been employed in SAS for a longer time than those who did not have any sick leave in 2010.

7.2.2 Total sick leave

The total level of sick leave reported by cabin crew was also affected by age. But it shows on the contrary that cabin crew younger than 50 years old had the largest number of sick leaves. There may therefore be reason to believe that there is a tripartite division of the crew; one younger group that were not sick at all or barely sick, one medium aged group that counted for the largest part of the sick leaves, and a older part which counted for a smaller part of the sick leave, but who were sick. This division may come as a result of having the resource pool which works between 28-40%, and thereby are subjected to the regulations regarding leave described in section 2.1.3. This assumption may be supported by the fact that this position fraction has the lowest level of sick leave compared with the fractions 60%, 80% and 100%. Cabin crew in the resource pool were also younger than cabin crew in the other position fractions on the average, as explained in section 5.3.13. The research performed shows further that increased position fraction leads to an increase in the level of sick leave, and that there is a connection between position fraction and age.

There is further a positive correlation between the number of children between the ages 4 and 7 and the level of sick leave, stating that having more children within this age group leads to more sick leave. Another result is that those who commuted by bus during 2010 reported to be more often sick than those not commuting by the bus. The reason for this may not be obvious, but one might discover some relationships between those using the bus and other characteristics if one investigates it further. Previous research does support this finding.

Position fraction is the last characteristic that proved to have a connection with the level of sick leave. Cabin crew who worked as AP's reported to be sick less than those who worked as AS or AH, and of these three positions, crew working as AS was the most sick. The explanation for this may be that AP's on average are older than other cabin crew as described in section 5.3.15, and thereby falling within the group explained in first part of this section. It is important to notice that there is no clear indication of the direction of the connections between age and position. The research does not show if it is age or

position that leads to sick leave, but rather that there is a connection between age and sick leave, position and sick leave and age and position.

7.2.3 Work related injuries

Work related injuries counted for approximately 11,9% of the total level of sick leave during 2010. The research performed shows further that there is a positive correlation between age and reported sick leaves due to injuries, meaning that increased age leads to increased number of injuries. Another characteristic that have a relationship with the number of injuries are position fraction. The research shows that increased position fraction leads to increased sick leave due to injuries. The division performed between part time and full time employees supports this finding by proving that full time employees have a higher rate of injuries. One reason that may be argued is that crew employed in higher position fractions are in general more exposed to situations which may lead to injuries since they simply work more hours. Those working more hours may also be subjected to more wear and tear and thereby be more exposed for injuries than others.

7.2.4 Work related fatigue

Work related fatigue was reported to be the reason which had the second largest impact on the level of sick leave during 2010. Approximately 20,8% of the sick leave was due to fatigue. The research unveiled a range of individual and work related characteristics that affected the level of sick leave due to fatigue. There is first a connection between position fraction and fatigue, stating that higher position fraction leads to increased level of sick leave due to fatigue. This result is supported by the division between full time and part time employees, saying that full time employees reported fatigue more often. This result may be seen in connection with the result regarding injuries; those who are employed in a higher position fraction do work more hours, and are thereby exposed to the risk of getting higher fatigue. As previous noted, there is a connection between age and position fraction.

Employees in the variable group reported further to have a higher rate of sick leaves due to fatigue than those working in the fixed group. This may come as a result of the

unpredictable work schedule these cabin crew have. The unpredictable work schedule was rated as the most negative of the work related factors, while predictability of the schedule was one the most commented issues of the cabin crew. Variable group in itself was ranked as the third most negative factor while fixed group was ranked as the second most positive. Those working in the variable group were also on average older than those in the fixed group.

The type of routes which cabin crew operated had further an impact on the level of fatigue. Crew having long-haul flights in their schedule reported more fatigue than those operating short haul only. Crew on long-haul was on average older and had on the average less children in their household than those flying short-haul only. Children in household leads to another finding that may be a little out of the ordinary at first glance; those with children reported to have fewer sick leaves due to fatigue than those without children. There is a significant negative correlation between the number of children and the number of sick leave due to fatigue, meaning that fewer children or no children lead to increased fatigue. The reason for this may be that those with children in their household have reduced position fractions and operates short short-haul only, thereby being fewer hours away from home than their colleagues.

Marital status impacts also the level of fatigue. Cabin crew living as cohabitants or singles reported on average to have a higher level of sick leave due to fatigue than their married colleagues. The reason for this is not that clear, but there may be a connection between lifestyle and work related fatigue. This is though not uncovered by this study.

Position was the last characteristic affecting the level of fatigue. Cabin crew working as AH or AS reported sick due to fatigue more often than crew working as AP, and AS' reported the highest rate of fatigue. This may be connected with the fact that long-haul flights increases the level of fatigue and almost all of the AS' works on these flights. AS' and AH's are further younger than AP's on the average.

7.2.5 Infections

Infections was the reason which had the largest impact on the level of sick leave in 2010, accounting for approximately 33,1% of the total. The research performed did though not unveil any individual or work related characteristics that had a significant effect on the level of sick leave due to infections.

7.2.6 Child's sickness

Child's sickness counted for approximately 15,7% of total level of sick leave in 2010, and the most obvious cause for sick leave due to child's sickness was children in the household. Those with children reported a higher level of sick leave due to child's sickness than those without children. The level of sick leave was further correlated with the number of children, proving that an increase in the amount of children led to an increase in the level of sick leave due to sick children. This applies to respondents having children less than 12 years of age. Those having children between 4 and 7 years of age had the highest level of sick leave.

There is further a connection between the age of cabin crew and the level of sick leave due to child's sickness. Cabin crew younger than 49 years old have a higher level of this kind of sick leave than those older than 49. This may not be explained by saying that those older than 49 have fewer children under 12 years old than those younger than 49 since there is no large difference on the average age between the two groups, as presented in table 5.3.

Position fraction is the third characteristic that affects the level of sick leave due to child's sickness. Cabin crew working 60% have significant the highest rate of sick leave due to children. 80% comes second while 100% and 28-40% comes third and fourth respectively.

Those working as AH has further the highest level of sick leave due to children compared with the other positions, while those commuting by subway or by the Airport Express Train have a lower level of sick leave. Commuting may be connected with sick leave due to sick children because of the living situation of families, stating that those with children e.g. generally live closer to Gardermoen and not in the city centre of Oslo.

At last, years employed as cabin crew in SAS have a positive effect on the level of sick leave; cabin crew with more years of employment reports fewer sick leaves due to child's sickness. As with age, this connection may not be explained by the saying that those who have worked in SAS for longer have fewer children under 12 in their household since the number presented in table 5.3 states otherwise.

7.2.7 Other

Other reasons for sick leave not covered by this thesis counts for 18,6% of the total sick leave and is ranked as the category which had the third largest impact. The research unveiled that age had a positive correlation with the level of sick leave due to this reason, stating that increased age led to increased sick leave due to other reasons not covered by the research. Respondents without children between the ages 0 and 12, crew working long- and short-haul and crew positioned as AH reported further to have a higher level of sick leave due to this reason compared to those without children within the category, those working short-haul only and AP's and AS' respectively.

7.3 Main limitations

In most studies there are factors and angles that are not visible in the starting phase of a research, the same applies for this master thesis. Limitations regarding the methodology are presented in section 4.5, while this section deals with the limitations of the thesis as a whole.

The analysis and results of the master thesis are only valid and valuable for Scandinavian Airlines in Norway. The theoretical procedure, with some modifications, may though be valuable for other operational departments within the SAS Group. The value of the results may further be of limited value since it only covers a short time span, a time span which included relatively big changes in the organisation. These changes may have a larger impact on the level of sick leave than assumed. Such impacts have not been uncovered due to the time span. Furthermore, sick leave experienced in the division may be due to reasons occurring previous to the examined time period.

Another limitation is that this thesis does not research all potential reasons for sick leave, but only those connected to operations through individual and work related characteristics. Reasons such as non-work related accidents and injuries, non-work related fatigue and other should therefore not be excluded. Due to the aim of this study, these reasons are though left out.

A last limitation is that the research performed does not fully unveil the connection between the individual and work related characteristics. E.g. position fraction and children in household is proved to have an impact on the level of sick leave, but the authors have not fully managed to uncover a relation between position fraction and children in household. Characteristics such as these may have a larger impact on each other than first assumed, and thereby affect the results.

7.4 Recommendations for further research

This research has only been conducted on cabin crew in the Norwegian department in Scandinavian Airlines. A natural step for further research may be to expand the focus and include pilots, ground service personnel and cabin crew in Sweden and Denmark.

Another issue for further research is to investigate what affects short term sick leave versus long term sick leave for cabin crew. This study does not have a clear distinction between the two, and it is therefore recommended that further research will be done to have a better understanding of sick leave within the two terms.

Sick leave amongst cabin crew in the context of load factor and work load on different routs might also be researched further. The amount of information and statistics needed to conduct such research was too comprehensive for the time span of this study, but it is believed that it can have an effect on the level of sick leave. High load factor proved to be a positive thing for cabin crew when the factors was analysed, but there may be other connections worth discovering.

Infections was difficult to analyse as there were no proper measure to compare it with and therefore the authors recommend further research on this possible cause of sick

leave. It may be interesting to see if cabin crew experiences a higher level of sick leave due to infections than other industries. This applies also for fatigue. The subject is comprehensive and highly actual in the case of aviation. The reasons for sick leave cited as *Other* throughout the study should further be investigated due to the significant impact of certain undiscovered reasons for sick leave covered by this term.

The authors recommend that further research is done on the subject of cabin crew and sick leave in general over a longer time span. As the world's economy and the dynamic marked that the airlines operates in changes, so will the national and international laws and regulations concerning aviation. At this stage it is unknown how this will affect cabin crew and if it will have any impact on the level of sick leave.

7.5 Concluding remarks

Through the research the authors have uncovered individual and work related characteristics affecting the level of sick leave within SAS. However, SAS is not directly able to influence the individual characteristics such as age, gender, marital status and commuting. Certain measurements may though be implemented to reduce the sick leave connected with these characteristics, e.g. have different focuses on different age groups.

The work related characteristics on the other may be easier to focus on since they are connected to operations and production. Characteristics such as position fraction, group, routes and position proved to have significant effect on the level of sick leave in 2010. SAS may be able to facilitate solutions that reduce the impact these have on sick leave.

The authors recommend that SAS further takes note of the results regarding the work related factors and the comments given by cabin crew since it express current issues within the organization. The results may provide SAS with information regarding scheduling of cabin crew and how to optimize it in the future.

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Appendix 1: Schedule/roster

Figure A1.1 shows a schedule/roster for a cabin crew in July 2010. In consist of two work blocks of five and four days. The first block is a 5-day route, while the second consists of a daytrip and 2-day route. This is noticeable since the daytrip in the second work block starts and ends at the base of the cabin crew, OLS.

Crew Services - Roster 22MAY11 2050 (UTC)

Date		Duty	Activity	C/I	From	STD	STA	To	C/O	Stop time
Th	08JUL10		4755	1320	OSL	1420	1625	FRA		00:55
		V	4756		FRA	1720	1915	OSL		01:00
			4055		OSL	2015	2105	SVG		11:55
Fr	09JUL10		4611		SVG	0900	0905	ABZ		00:35
			4612		ABZ	0940	1140	SVG		20:25
Sa	10JUL10		4657		SVG	0805	1130	ALC		00:50
		V	4664		ALC	1220	1550	KRS		26:25
Su*	11JUL10		222		KRS	1815	1900	OSL		01:40
		X	4496		OSL	2040	2330	LYR		15:15
Mo	12JUL10		4425		LYR	1445	1620	TOS		00:50
			4425		TOS	1710	1900	OSL	1915	86:55
Tu	13JUL10		F							
We	14JUL10		F							
Th	15JUL10		F							
Fr	16JUL10		4675	0855	OSL	0955	1350	ALC		00:50
		V	4676		ALC	1440	1825	OSL	1840	16:05
Sa	17JUL10		TAX		OSL	1030	1230	TRF		
		VO	7361		TRF	1315	1600	SPU		00:50
		V	7348		SPU	1650	1945	BGO		19:10
Su*	18JUL10		4174		BGO	1455	1540	AES		00:20
			4174		AES	1600	1640	TRD		01:40
		X	377		TRD	1820	1915	OSL		00:40
			4434		OSL	1955	2140	TOS		00:20
			4434		TOS	2200	2235	ALF		19:40
Mo	19JUL10		4545		ALF	1815	2015	OSL	2030	59:50
Tu	20JUL10		F							
We	21JUL10		F							

Figure A1.1: Schedule/roster for June 2010

Appendix 2: Standard operation procedures and service responsibilities for cabin crew on Boeing 737's in SAS

The standard operating procedures (SOP) and service responsibilities for cabin crew in SAS in Norway for 2010 are presented in this appendix. This presentation is written with inspiration from Nesthus and Schroeder (2007).

For identification of cabin level doors on aircrafts, and thereby crew designated to each position, SAS uses the following description (SAS, 2011c):

- A figure starting with "1" and beginning from the front of the aircraft in the direction of flight
- A letter "L" or "R" to indicate the side of the aircraft as seen in the direction of flight

1R, 2L and 3R constitutes the demanded number of crew positions on an aircraft with 150 seats or less. The position 1L is added if the number of seats exceeds 150, whiles positions 2LX and 2RX are added if the level of service makes it necessary. The points below describe a regular flight with three cabin crew.

1.0 Ground duties at home base
- 1.1 Check in 1 hour prior to the first flight of the day at base
- 1.2 Ten minutes to review company e-mail and mail
- 1.3 Attend/ or hold the preflight safety briefing (PFSB) at the briefing room. PFSB shall be held for minimum cabin crew, before each flight and before passenger embarkation. It may be reduced provided that it is the same aircraft, the same cabin crew and at the same day. A complete briefing shall include the following items (mandatory items marked with *):
  - 1.3.1 Verify crew list and that minimum cabin crew is present
  - 1.3.2 Check crew documents
  - 1.3.3 Aircraft type and version for operation
  - 1.3.4 Allocation of cabin crew to stations
  - 1.3.5 Safety/security matters *
  - 1.3.6 Three safety questions
  - 1.3.7 CC Preflight Emergency Equipment Check
  - 1.3.8 CC preflight Security Check (when applicable) *
  - 1.3.9 Crew meals (when applicable) *

1.3.10 Special categories of passengers (unaccompanied minors, infants, deportees, persons with reduced mobility and stretcher cases)*
1.3.11 Ares and type of operation (when briefed by the commander (CDR))*
1.4 Locate and access aircraft
1.5 Stow crew baggage onboard

2.0 Checking of aircraft
2.1 CC preflight Emergency Equipment Check (shall be done at originating stations, at crew change and if the aircraft has been left unattended). Check:
2.1.1 Emergency slide pressure
2.1.2 Flashlight
2.1.3 Crew life vest
2.1.4 Smoke hood
2.1.5 Fire extinguisher, Halon
2.1.6 Fire extinguisher, water
2.1.7 Emergency Medical Kit (EMK)
2.1.8 First Aid Kit (FAK)
2.1.9 Automated External Defibrillator (AED)
2.1.10 Artificial Respiration Mask
2.1.11 Oxygen bottles
2.1.12 Megaphone
2.1.13 Life vest, infant
2.1.14 Infant / extension belt
2.1.15 Safety demo kit
2.1.16 Dangerous goods kit
2.1.17 Restraint kit
2.1.18 Sign responsibility chart when finished
2.2 CC Preflight Security check
2.2.1 Check galley (1R – forward (fwd), 2L aft)
2.2.1.1 Compartments
2.2.1.2 Lockers
2.2.1.3 Waste
2.2.1.4 Surfaces
2.2.2 Check lavatory (1R – fwd, 2L aft)
2.2.2.1 Compartments
2.2.2.2 Smoke detector
2.2.2.3 Waste
2.2.2.4 Surfaces
2.2.3 Check cabin (1R – fwd, 2L aft)
2.2.3.1 Compartments
2.2.3.2 Overhead bins

2.2.3.3 All seat pockets
2.2.3.4 Minimum Ten or 5% of the life vests containers
2.2.3.5 Underneath seat rows
2.2.3.6 Surfaces
2.2.4 Assist according to instructions from 1R (2R)
2.2.5 Maintain sterility

2.3 General
2.3.1 Check crew meals
2.3.2 Check passenger meals (if applicable)
2.3.3 Check service equipment
2.3.4 Log in On Board Trader's (OBT) (2L)

3.0 Embarkation
3.1 Take boarding positions
3.2 Monitor passengers
3.3 Be aware of the positions of servicing and loading vehicles at and near exits
3.4 Monitor boarding facilities
3.5 Greet passengers

4.0 Boarding complete
4.1 1R duties:
4.1.1 Announce boarding complete
4.1.2 Check and lock fwd lavatory
4.1.3 Count total number of passengers (if applicable)
4.1.4 Count passengers in forward most and aft most cabin sections
4.1.5 Hand over complete Responsibility Chart / Cabin slip
4.1.6 Confirm total number of passengers and categories
4.1.7 Coordinate cabin door closure
4.1.8 Close doors 1L and 1R
4.1.9 Arm doors 1L and 1R
4.1.10 Get report from 2R regarding armed doors
4.1.11 Initiate safety demonstration
4.2 2L duties:
4.2.1 Close doors 2L and 2R
4.2.2 Check and lock aft lavatories
4.2.3 Safety announcement part 1
4.2.4 Arm doors 2L and 2R
4.3 2R duties:
4.3.1 Distribute infant life vest and infant/extension belts
4.3.2 Check cabin
4.3.2.1 All cabin baggage are properly stowed

4.3.2.2 The way to the over wing exits are cleared
4.3.2.3 Window shades are open at all exits
4.3.2.4 Blankets are stowed
4.3.2.5 All objects secured
4.3.2.6 Dividers are secured
4.3.2.7 Seatbelts are fastened
4.3.2.8 All seats in an upright position
4.3.2.9 Tables folded
4.3.2.10 All electronic equipment switched of
4.3.2.11 Brief over wing passengers next to emergency exits about their duties

4.3.3 Report cabin checked to 1R
4.3.4 Report that doors are armed and checked

4.4 General

4.4.1 Secure all carts and loose items
4.4.2 Check cabin baggage and clothes
4.4.3 Check mass and balance (unusual seating and location of passengers shall be reported)

5.0 Aircraft movement on ground

5.1 Safety demonstration
5.2 Report cabin clear
5.3 Turn of cabin lights
5.4 Receive takeoff imminent warning from CDR

6.0 Takeoff procedure

6.1 Sit at jump seat with seatbelt fastened
6.2 Perform “Silent Review”. Includes:

6.2.1 A – Aircraft type (“Which aircraft am I on? How do I open exits?”
6.2.2 B – Brace positions (“How do I brace for impact”)
6.2.3 C – Commands (“What are the commands?”)
6.2.4 D – Duties (“Which are my evacuation duties and on ground duties?”)

7.0 Cruise

7.1 After takeoff announcement
7.2 Unlock lavatories
7.3 Guard lavatories during flight (check minimum every 30 min)

7.3.1 Check for smoke or smell of smoke
7.3.2 Check that flaps and doors of waste containers are closed
7.3.3 Check that smoke detectors are not tampered with

7.4 Guard galleys and cabins, areas where warning signals and calls are given
7.5 Service
7.5.1 General
7.5.1.1 Make service announcement
7.5.1.2 Hand out toys to children
7.5.1.3 Prepare trolleys
7.5.1.4 Brew coffee and tea
7.5.1.5 Turn on ovens for hot crew meals (if applicable)
7.5.1.6 Serve flight deck beverages and/or meals
7.5.1.7 Do not leave carts and trolleys unsecured
7.5.1.8 Stowe away loose items
7.5.1.9 Stowe away carts and units not needed to perform service
7.5.1.10 Close doors and lockers and secure them when not in use
7.5.1.11 Collect waste between services, several times if longer trips
7.5.1.12 Log out of OBT's when finishing service
7.5.1.13 Count cash
7.5.2 Flights in Norway
7.5.2.1 Serve coffee and tea
7.5.2.2 Sell items from trolley (snacks and beverages)
7.5.3 Flights between OSL, CPH and ARN
7.5.3.1 Serve beverages to Economy Extra
7.5.3.2 Serve meals to Economy Extra
7.5.3.3 Sell items from trolley to Economy (snacks and beverages)
7.5.3.4 Sell Duty Free items to passengers
7.5.4 Flights between Norway and Europe
7.5.4.1 Hand out magazines to Business
7.5.4.2 Hand out and collect hot cloths to Business
7.5.4.3 Serve beverages to Business and Economy Extra
7.5.4.4 Serve meals to Business and Economy Extra
7.5.4.5 Serve hot rolls to Business
7.5.4.6 Serve coffee and tea to Business and Economy Extra
7.5.4.7 Sell items to Economy (food, snacks and beverages), twice if is a long trip
7.5.5 Charter
7.5.5.1 Hand out forms for ordering of duty free items on homebound flight
7.5.5.2 Serve beverage to passengers who have prepaid it
7.5.5.3 Sell beverages and snacks to the rest, twice if it is a long trip
7.5.5.4 Serve meals to passengers who have prepaid it

7.5.5.5 Sell Duty Free items to passengers, collect payment for preordered items

8.0 Arrival procedure
- 8.1 Before landing announcement
- 8.2 Check and lock lavatory
- 8.3 Check cabin according to 4.3.2
- 8.4 Report cabin checked to 1R

9.0 Landing procedure
- 9.1 Sit at jump seat with seatbelt fastened
- 9.2 Perform “Silent review” according to 6.2

10.0 After final stop and sign off
- 10.1 After landing announcement
- 10.2 Disarm doors after final stop (1R and 2L)
- 10.3 Give report (2R)
- 10.4 Receive report (1R)
- 10.5 Open doors when knocking signal given from the outside
- 10.6 Check with ground staff before disembarkation
- 10.7 Greet passengers

11.0 Turn around procedure
- 11.1 Turn around within Norway
  - 11.1.1 Collect waste
  - 11.1.2 Perform CC Security Check of the cabin
- 11.2 Turn around outside Norway
  - 11.2.1 Check ID on cleaning staff
  - 11.2.2 Monitor cleaning staff
  - 11.2.3 Prepare service

12.0 Final stop at other airport than home base
- 12.1 Pick up outside airport by transport company
- 12.2 Transport to pre-booked hotel
- 12.3 Pick up at hotel at scheduled time
- 12.4 Attend/hold PFSB according to 1.3

Appendix 3: Injuries

Table A3.1 shows the amount of reported injuries in the period 2008 to 2010, and the amount of reported injuries that led to sick leave. The last column shows the percentage of reported injuries that let to sick leave during the period.

Injuries	**Injuries occurred in SAS**			**Sum**	**Injuries occurred leading to sick leave**			**Sum**	**Injuries leading to sick leave**
	2008	2009	2010		2008	2009	2010		
Fall, slippery	0	7	5	12	0	2	4	6	50,0 %
Fall, height	7	2	1	10	0	0	1	1	10,0 %
Fall	5	9	6	20	3	0	2	5	25,0 %
Wedged	5	3	3	11	1	2	1	4	36,4 %
Twist of body/body parts	7	4	9	20	4	1	5	10	50,0 %
Blow to the head	3	3	0	6	0	0	0	0	0,0 %
Jerk	1	0	0	1	0	0	0	0	0,0 %
Chemicals/splash in eyes	1	3	3	7	0	0	0	0	0,0 %
Shock/hit by object	10	7	20	37	0	1	6	7	18,9 %
Cut/Stung	3	2	0	5	2	0	0	2	40,0 %
Car accident	0	0	1	1	0	0	0	0	0,0 %
Noise	2	4	1	7	1	1	2	4	57,1 %
Hard landings	21	19	11	51	6	1	2	9	17,6 %
Turbulence	14	4	13	31	8	2	4	14	45,2 %
Other	10	0	3	13	2	0	1	3	23,1 %
Sum	89	67	76	232	27	10	28	65	28,0 %

Table A3.1: Injuries. Source: SAS (2011l)

Appendix 4: Data regarding sick leave

Sick leave	2004	2005	2006	2007	2008	2009	2010	Average
SAS Norway - cc			12,94 %	12,82 %	12,11 %	10,47 %	11,41 %	12,0 %
SAS Norway - total	6,40 %	8,60 %	9,83 %	8,89 %	8,70 %	8,39 %	9,51 %	8,6 %
NAS - total	7,10 %	6,70 %	6,90 %	6,90 %	7,00 %	7,50 %	6,40 %	6,9 %
Norway – general	6,20 %	4,60 %	6,80 %	5,70 %	5,80 %	6,80 %	6,83 %	6,1 %

Table A4.1: Sick leave 2004-2010. Sources: SAS (2005, 2006, 2011a), Norwegian (2005, 2006, 2007, 2008, 2009, 2010, 2011) and Statistics Norway (2010).

Sick leave - Monthly	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
CC 2006	12,4 %	12,4 %	13,2 %	13,2 %	12,8 %	13,5 %	14,9 %	14,8 %	13,6 %	13,3 %	11,3 %	10,3 %
CC 2007	12,6 %	13,0 %	12,9 %	12,5 %	13,8 %	12,9 %	12,9 %	12,0 %	13,3 %	13,2 %	13,2 %	11,8 %
CC 2008	12,0 %	13,6 %	13,3 %	12,9 %	12,9 %	13,0 %	11,7 %	11,2 %	13,1 %	11,4 %	10,2 %	10,1 %
CC 2009	10,1 %	9,8 %	10,4 %	9,0 %	9,9 %	11,2 %	10,3 %	10,5 %	12,0 %	11,7 %	11,7 %	9,0 %
CC 2010	10,5 %	10,6 %	12,3 %	11,0 %	12,2 %	12,4 %	10,3 %	10,3 %	13,2 %	11,9 %	12,2 %	10,4 %

Table A4.2: Sick leave – Monthly. Source SAS (2011a)

Sick leave – Bases	2006	2007	2008	2009	2010
Cabin TRD	13,4 %	13,9 %	9,6 %	10,1 %	14,0 %
Cabin SVG	9,7 %	10,8 %	12,0 %	9,1 %	9,1 %
Cabin OSL	12,1 %	13,3 %	13,4 %	11,3 %	12,2 %

Table A4.3: Sick leave – Bases. Source: SAS (2011a)

Sick leave – duration	2008	2009	2010
1-8 days	2,21 %	1,97 %	2,06 %
9-16 days	1,15 %	1,06 %	1,10 %
>16 days	8,75 %	7,43 %	8,26 %
Sum	12,11 %	10,46 %	11,42 %

Table A4.4: Sick leave – SAS 2008-2010. Source: SAS (2011f).

Appendix 5: Questions in the questionnaire (English)

Part 1:

The following questions apply for your situation in 2010 (information text)

1.0 Gender (compulsory, single choice)

Male
Female

2.0 Age (compulsory, single choice, dropdown menu)

Select answer :
(between 20 and 70)

3.0 Marital status (compulsory, single choice)

Married
Cohabitant
Single
Other
Do not wish to answer

4.0 Were there any children in your household in 2010? (compulsory, single choice)

Yes (leads to additional question 4.1)
No
Do not wish to answer

4.1 How old was the child living in your household in 2010? If you had more than one, note the age with a comma in between each answer.(not-compulsory, open text box)

Part 2:

The following questions apply for your situation in 2010 (information text)

5.0 Which base did you belong to?(non-compulsory, single choice)

OSL
TRD
SVG

6.0 Residence(compulsory, single choice, dropdown menu)

Select answer:
Akershus
Aust-Agder
Buskerud
Finmark
Hedmark
Hordaland

Møre og Romsdal
Nordland
Nord-Trøndelag
Oppland
Oslo
Rogaland
Sogn og Fjordane
Svalbard
Sør-Trøndelag
Telemark
Troms
Vest-Agder
Vestfold
Østfold
Do not wish to reply
Other, specify here (open box)

7.0 Which means of transport did you mainly use to work? (You may choose more than one) (compulsory, multiple choice, randomized order)

Car
Boat
Bus
Tram
Subway
Train
Airport express train
Airplane
Other, specify here (open box)

The following questions apply for your situation in 2010 (information text)

8.0 Which position fraction did you belong to? (non-compulsory, single choice)

28-40%
60%
80%
100%

9.0 Which group did you belong to? (non-compulsory, single choice)

Fixed
Variable
Resource Pool

10.0 Which routes did you operate?(non-compulsory, single choice)

Short-long
Short (incl. The Resource Pool)

11.0 Which position did you have?(non-compulsory, single choice)

AP
AS
AH

12.0 Approximately, for how long have you been working as a cabin crew in SAS? (compulsory, single choice)

Don't know
Number of years: (open box, forced to write numbers)

Part 3:

13.0 Did you call in sick to Crew Control during 2010?(compulsory, single choice)

Yes(leads to additional questions 13.1 and 13.2)
No
Do not wish to answer
Don't know

13.1 Approximately how many times did you call in sick to Crew Control during 2010? (compulsory, single choice, drop down menu)

Select answer
(between 1 and 15)
Above 15
Don't know

13.2 If you can relate your absence to any of the alternatives below, please state the number of times (not days) it occurred during 2010?(compulsory, single choice, matrix)

Scale: Not occurred / 1 / 2 / 3 / 4 / 5 / Above 5 / Don't know

Work related physical injury
Work related fatigue
Infections
Child's sickness
Other

(Information text)
Work related physical injury: fractures, tendon injuries and cuts
Work related fatigue: sense of fatigue
Infections: virus- and bacterial infections

Part 4:

14.0 To which degree did the following variables affect your general work day in 2010?(compulsory, single choice, matrix)

Scale: Negative / Partially negative / No affect / Partially positive / Positive / Don't know/Not relevant

Check in 00:00-08:00
Check in 08:00-16:00
Check in 16:00-24:00

Check out 09:00-17:00
Check out 17:00-01:00
Check out 01:00-09:00
Daytrip
2-day route
3-day route
4-day route
5-day route

15.0 To which degree did the following variables affect your general work day in 2010? (compulsory, single choice, matrix)
Scale: Negative / Partially negative / No affect / Partially positive / Positive / Don't know/Not relevant

Scheduled traffic
Charter traffic
Aircraft CL (Classic)
Aircraft NG (Next Generation)
Flights within Norway
Flights between Norway and Europe
Flights between OSL, CPH and ARN

16.0 To which degree did the following variables affect your general work day in 2010? (compulsory, single choice, matrix)
Scale: Negative / Partially negative / No affect / Partially positive / Positive / Don't know/Not relevant

Fixed group
Variable group
Unpredictable work schedule
Breaks over 3 hours
Breaks less than 3 hours
Block time over 3 hours
Block time less than 3 hours
Workday over 8 hours

17.0 To which degree did the following variables affect your general work day in 2010? (compulsory, single choice, matrix)
Scale: Negative / Partially negative / No affect / Partially positive / Positive / Don't know/Not relevant

High load factor
Large Business/Extra
Large Economy
Summer season
Winter season
Colleagues
Often change of colleagues
Passenger's nationality

Part 5:

18.0 How much do you agree with the following statement? (compulsory, single choice, drop down menu)

Long days with few legs are better than short days with multiple legs.

Select answer

- Disagree
- Partially disagree
- Either or
- Partiallty agree
- Agree
- Don't know

Complete the sentences (informational text)

19.0 My rest between blocks are(compulsory, single choice, drop down menu)

Select answer

- too short
- partially too short
- sufficient
- partially too long
- too long
- don't know

20.0 Variation between early and late check-in in the same work block affects me in (compulsory, single choice, drop down menu)

Select answer

- a negative degree
- a partially negative degree
- no degree
- a partially positive degree
- a positive degree
- Don't know

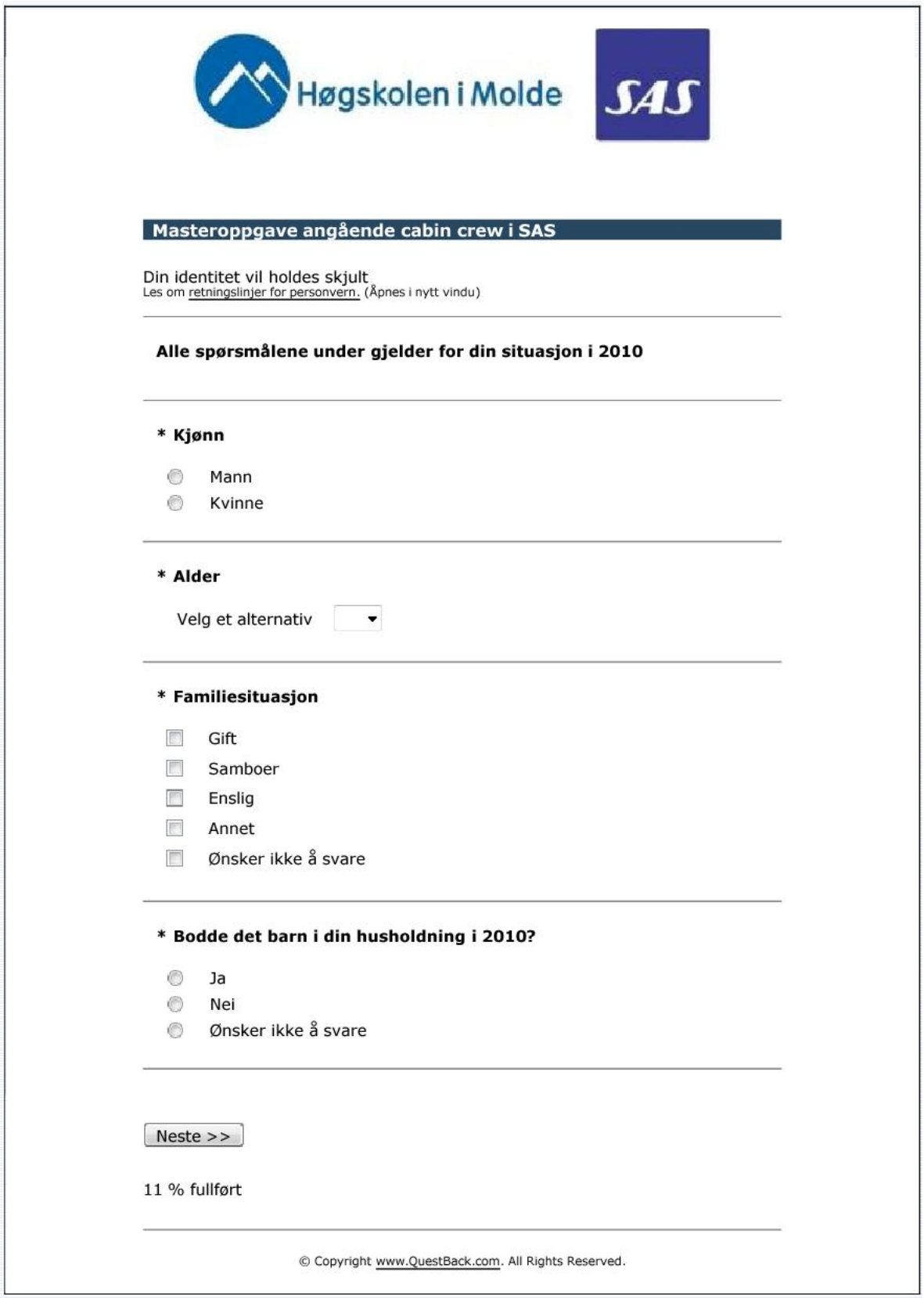
21.0 Comments / other factors that may affect absence or work situation in a positive or negative way: (non-compulsory, open text box)

n/a

Appendix 6: The Questionaire (Norwegian)

Questions marked with * are compulsory.

Page 1:



Høgskolen i Molde

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Din identitet vil holdes skjult
Les om retningslinjer for personvern. (Åpnes i nytt vindu)

Alle spørsmålene under gjelder for din situasjon i 2010

*** Kjønn**

- Mann
- Kvinne

*** Alder**

Velg et alternativ

*** Familiesituasjon**

- Gift
- Samboer
- Enslig
- Annet
- Ønsker ikke å svare

*** Bodde det barn i din husholdning i 2010?**

- Ja
- Nei
- Ønsker ikke å svare

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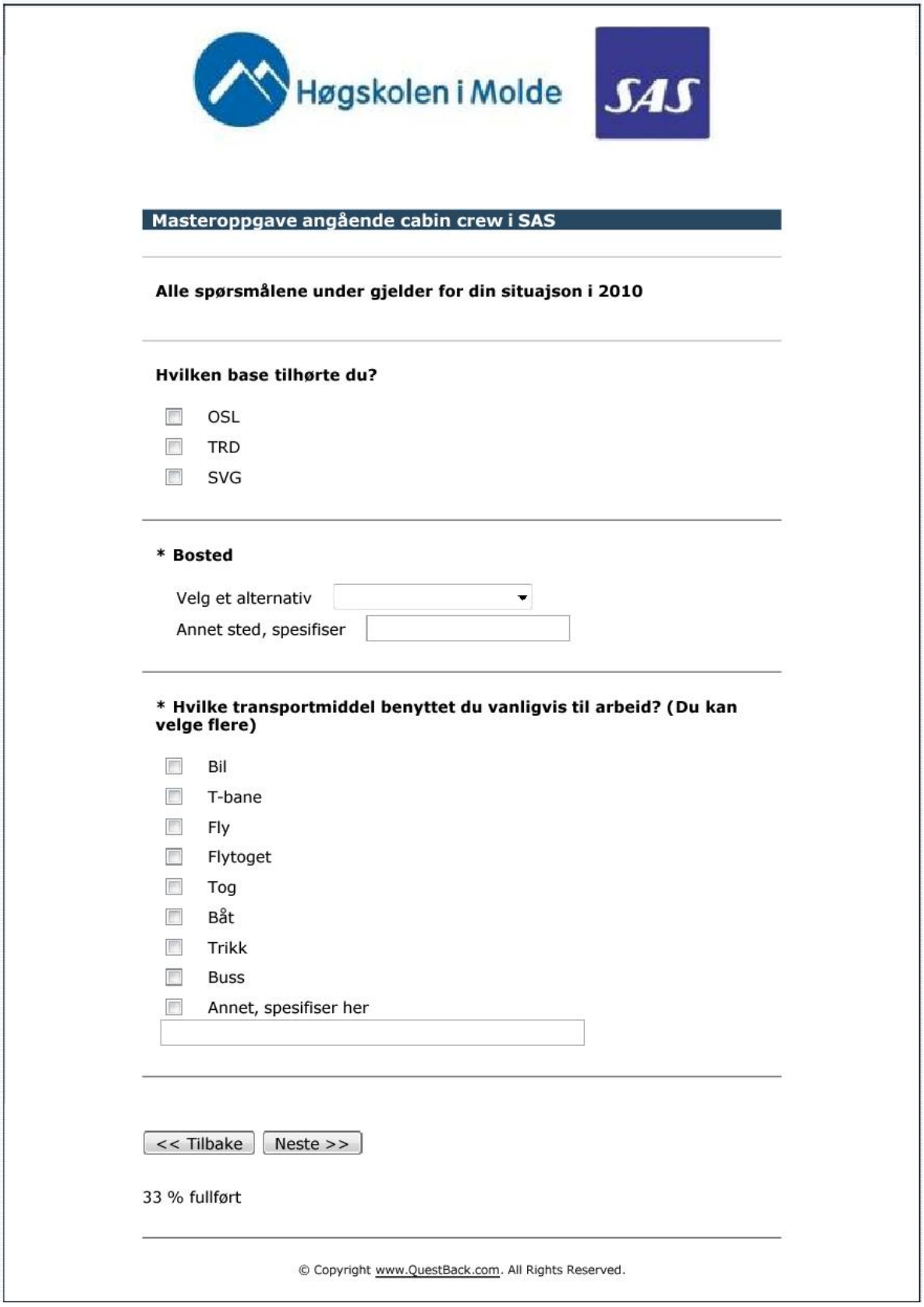
Page 2: Appears if you choose the option “Ja” on the last question on the previous side.

Page 3:



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Alle spørsmålene under gjelder for din situajson i 2010

Hvilken base tilhørte du?

- [ ] OSL
- [ ] TRD
- [ ] SVG

*** Bosted**

Velg et alternativ

Annet sted, spesifiser

*** Hvilke transportmiddel benyttet du vanligvis til arbeid? (Du kan velge flere)**

- [ ] Bil
- [ ] T-bane
- [ ] Fly
- [ ] Flytoget
- [ ] Tog
- [ ] Båt
- [ ] Trikk
- [ ] Buss
- [ ] Annet, spesifiser her

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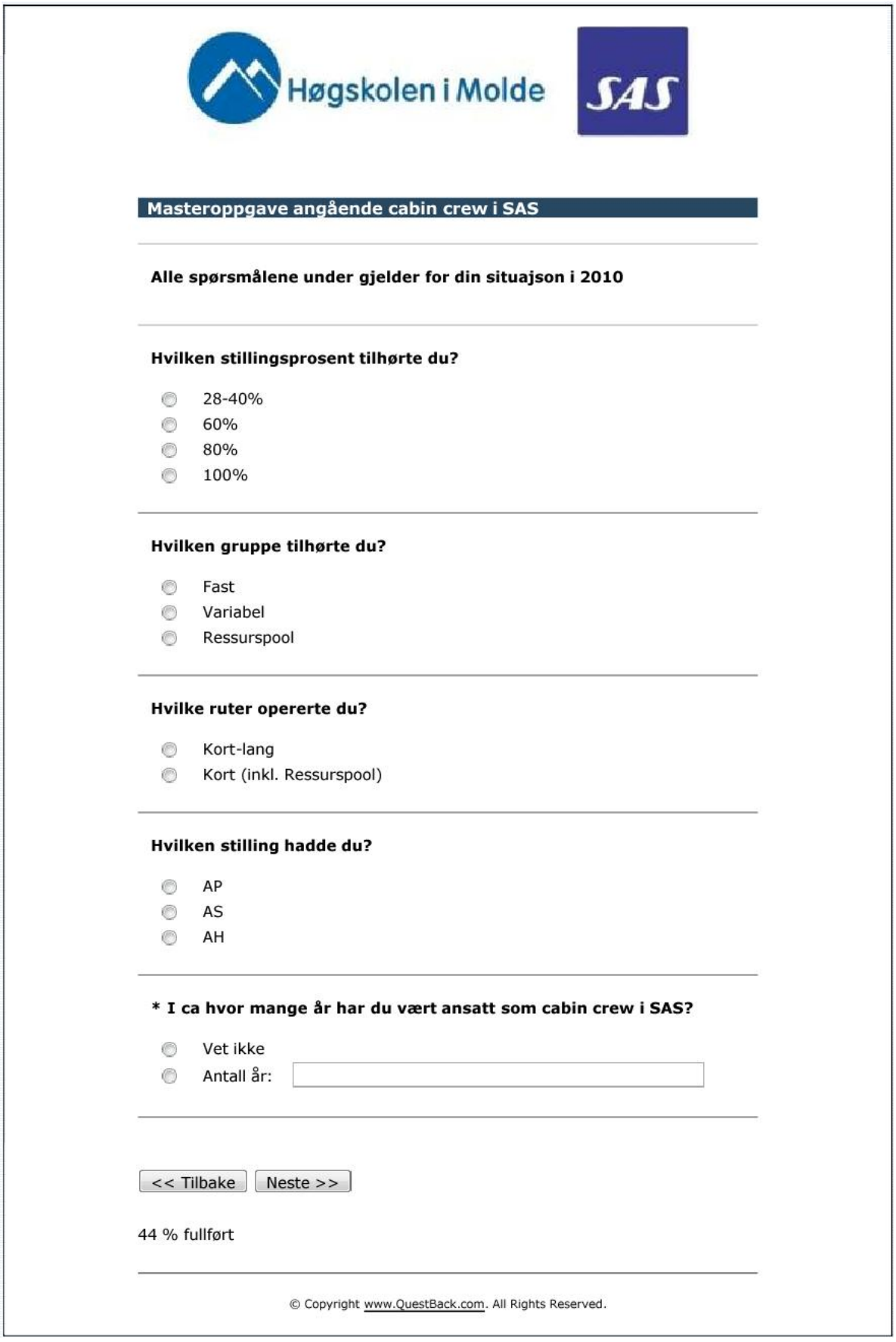

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Alle spørsmålene under gjelder for din situajson i 2010

Hvilken stillingsprosent tilhørte du?

- 28-40%
- 60%
- 80%
- 100%

Hvilken gruppe tilhørte du?

- Fast
- Variabel
- Ressurspool

Hvilke ruter opererte du?

- Kort-lang
- Kort (inkl. Ressurspool)

Hvilken stilling hadde du?

- AP
- AS
- AH

*** I ca hvor mange år har du vært ansatt som cabin crew i SAS?**

- Vet ikke
- Antall år:

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Page 5:


Høgskolen i Molde
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* Meldte du deg syk til Crew Control i løpet av 2010?
Ja
Nei
Ønsker ikke å svare
Vet ikke
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Neste >>
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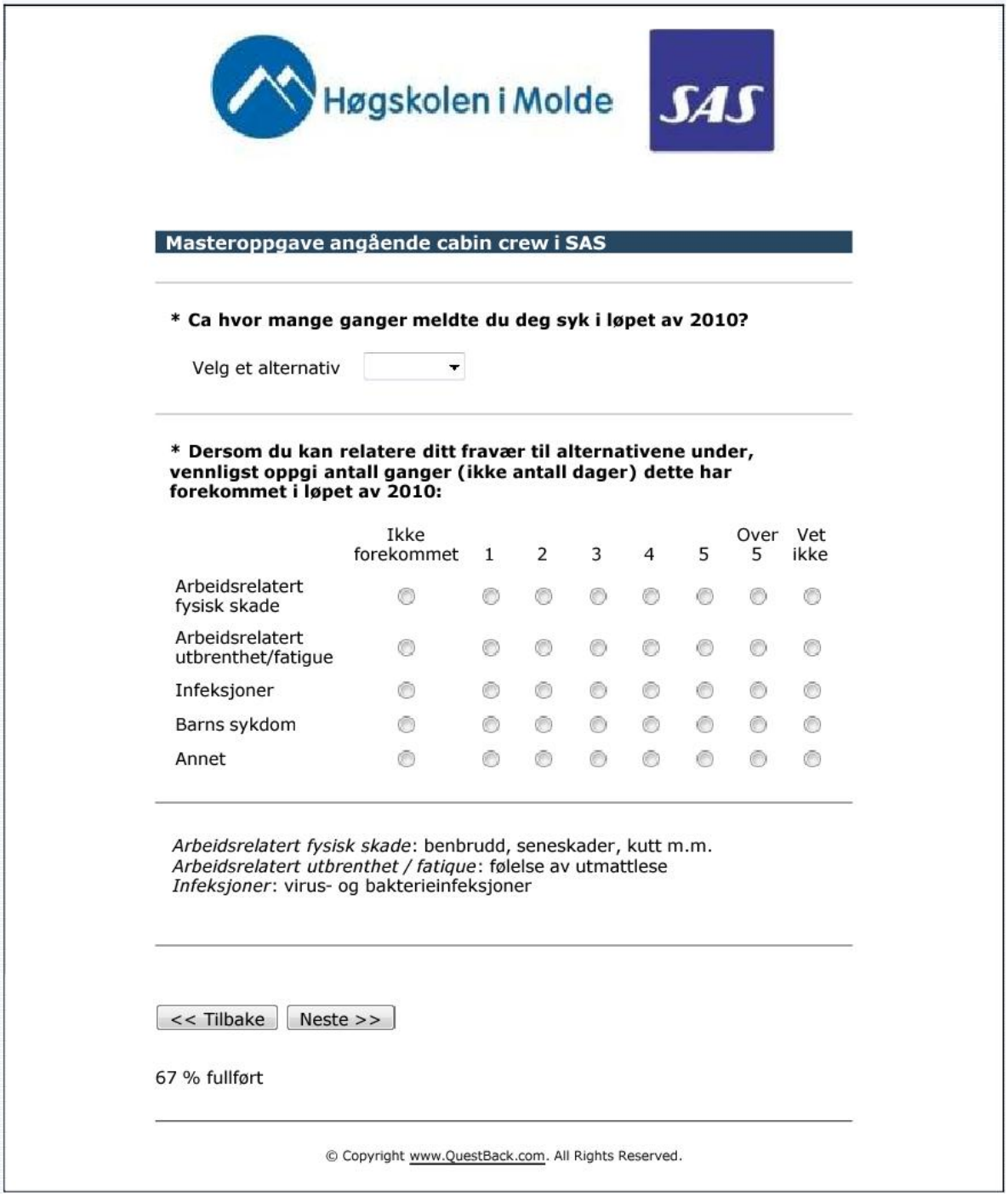
Page 6: Appears if you choose the option “Ja” on last question on the previous side.



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*** Ca hvor mange ganger meldte du deg syk i løpet av 2010?**

Velg et alternativ

*** Dersom du kan relatere ditt fravær til alternativene under, vennligst oppgi antall ganger (ikke antall dager) dette har forekommet i løpet av 2010:**

	Ikke forekommet	1	2	3	4	5	Over 5	Vet ikke
Arbeidsrelatert fysisk skade								
Arbeidsrelatert utbrenthet/fatigue								
Infeksjoner								
Barns sykdom								
Annet								

Arbeidsrelatert fysisk skade: benbrudd, seneskader, kutt m.m.
Arbeidsrelatert utbrenthet / fatique: følelse av utmattlese
Infeksjoner: virus- og bakterieinfeksjoner

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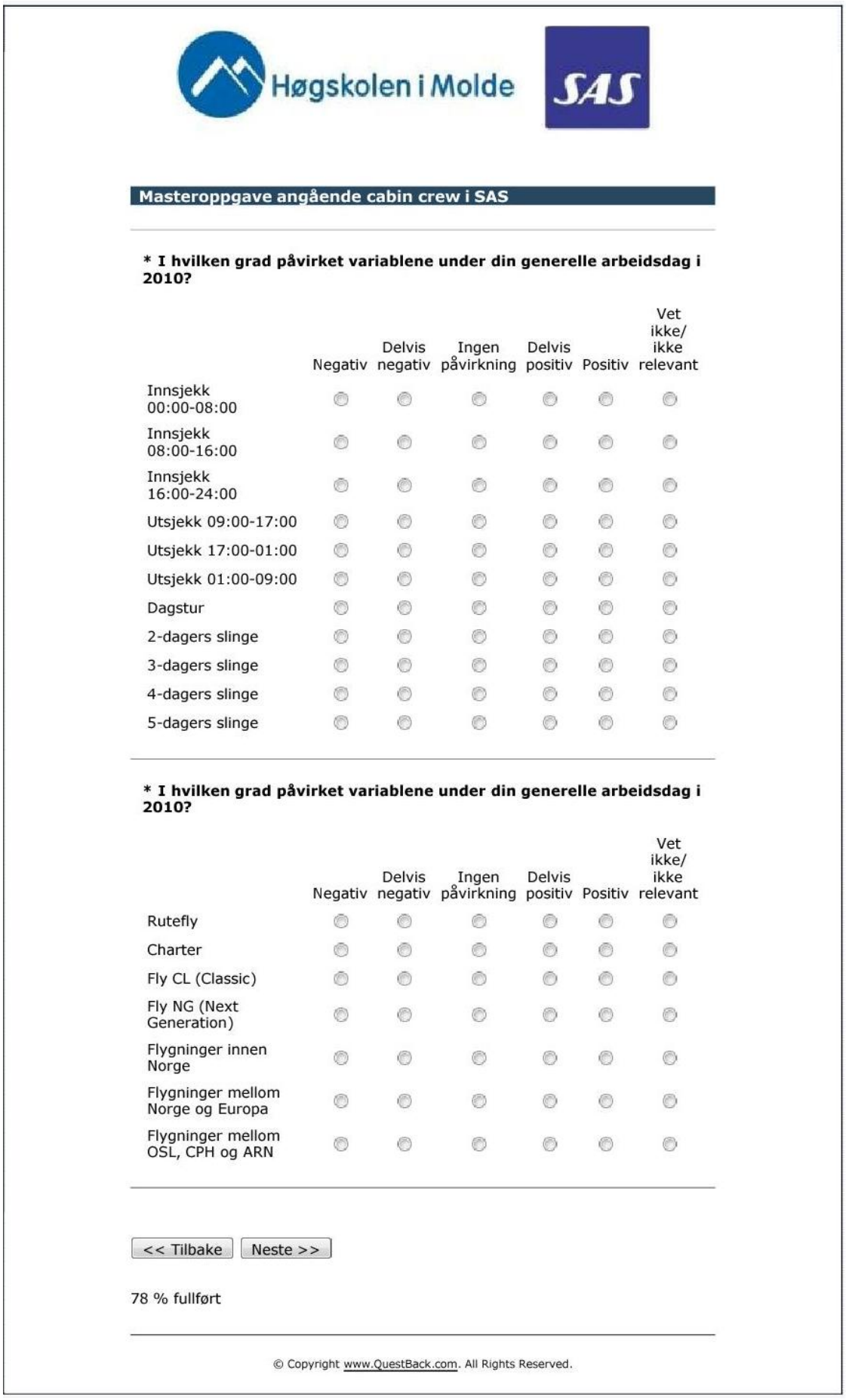

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*** I hvilken grad påvirket variablene under din generelle arbeidsdag i 2010?**

	Negativ	Delvis negativ	Ingen påvirkning	Delvis positiv	Positiv	Vet ikke/ ikke relevant
Innsjekk 00:00-08:00	○	○	○	○	○	○
Innsjekk 08:00-16:00	○	○	○	○	○	○
Innsjekk 16:00-24:00	○	○	○	○	○	○
Utsjekk 09:00-17:00	○	○	○	○	○	○
Utsjekk 17:00-01:00	○	○	○	○	○	○
Utsjekk 01:00-09:00	○	○	○	○	○	○
Dagstur	○	○	○	○	○	○
2-dagers slinge	○	○	○	○	○	○
3-dagers slinge	○	○	○	○	○	○
4-dagers slinge	○	○	○	○	○	○
5-dagers slinge	○	○	○	○	○	○

*** I hvilken grad påvirket variablene under din generelle arbeidsdag i 2010?**

	Negativ	Delvis negativ	Ingen påvirkning	Delvis positiv	Positiv	Vet ikke/ ikke relevant
Rutefly	○	○	○	○	○	○
Charter	○	○	○	○	○	○
Fly CL (Classic)	○	○	○	○	○	○
Fly NG (Next Generation)	○	○	○	○	○	○
Flygninger innen Norge	○	○	○	○	○	○
Flygninger mellom Norge og Europa	○	○	○	○	○	○
Flygninger mellom OSL, CPH og ARN	○	○	○	○	○	○

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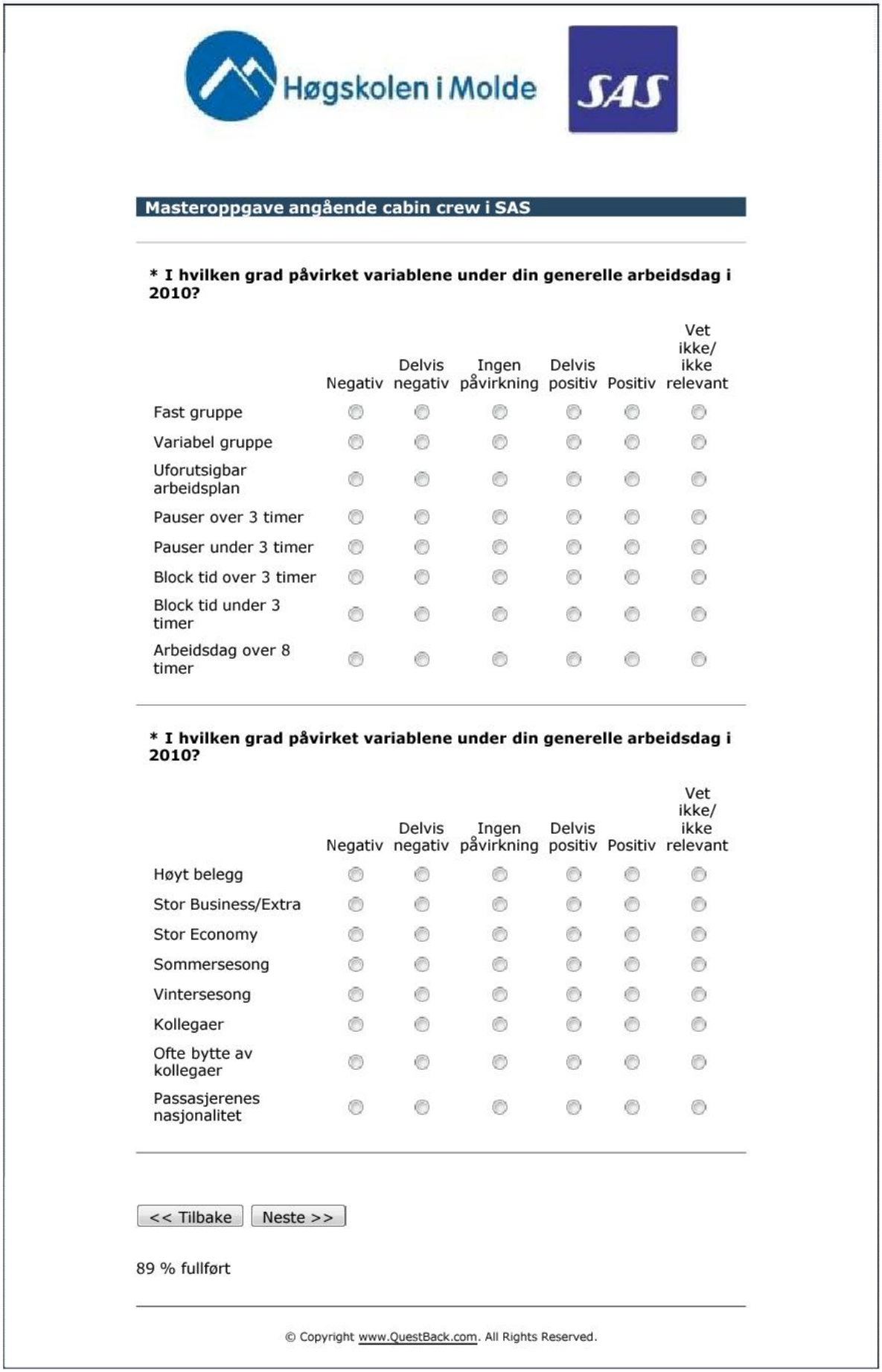
Page 8:



Høgskolen i Molde

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Masteroppgave angående cabin crew i SAS

*** I hvilken grad påvirket variablene under din generelle arbeidsdag i 2010?**

	Negativ	Delvis negativ	Ingen påvirkning	Delvis positiv	Positiv	Vet ikke/ ikke relevant
Fast gruppe	○	○	○	○	○	○
Variabel gruppe	○	○	○	○	○	○
Uforutsigbar arbeidsplan	○	○	○	○	○	○
Pauser over 3 timer	○	○	○	○	○	○
Pauser under 3 timer	○	○	○	○	○	○
Block tid over 3 timer	○	○	○	○	○	○
Block tid under 3 timer	○	○	○	○	○	○
Arbeidsdag over 8 timer	○	○	○	○	○	○

*** I hvilken grad påvirket variablene under din generelle arbeidsdag i 2010?**

	Negativ	Delvis negativ	Ingen påvirkning	Delvis positiv	Positiv	Vet ikke/ ikke relevant
Høyt belegg	○	○	○	○	○	○
Stor Business/Extra	○	○	○	○	○	○
Stor Economy	○	○	○	○	○	○
Sommersesong	○	○	○	○	○	○
Vintersesong	○	○	○	○	○	○
Kollegaer	○	○	○	○	○	○
Ofte bytte av kollegaer	○	○	○	○	○	○
Passasjerenes nasjonalitet	○	○	○	○	○	○

<< Tilbake Neste >>

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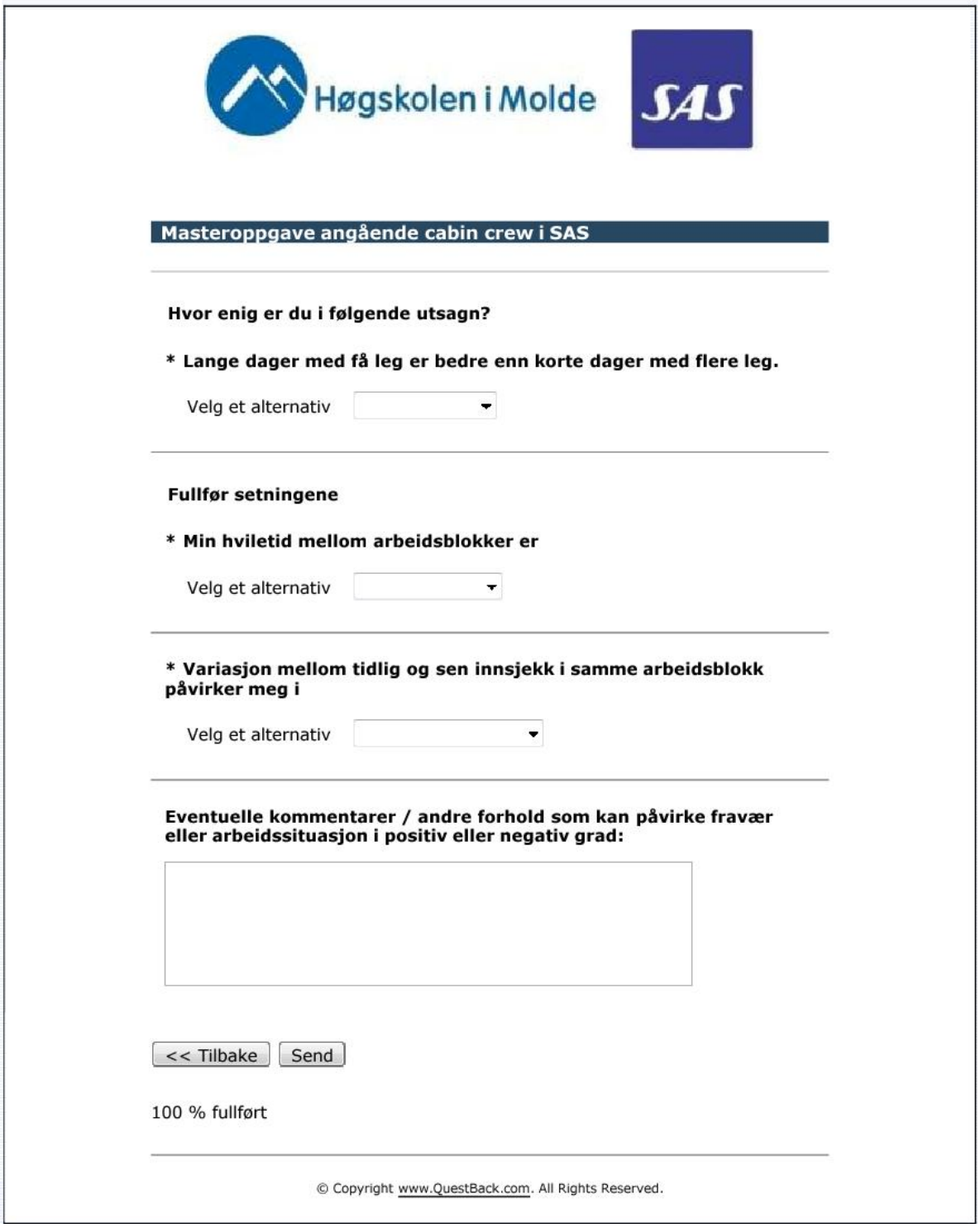

Høgskolen i Molde

SAS

Masteroppgave angående cabin crew i SAS

Hvor enig er du i følgende utsagn?

*** Lange dager med få leg er bedre enn korte dager med flere leg.**

Velg et alternativ

Fullfør setningene

*** Min hviletid mellom arbeidsblokker er**

Velg et alternativ

*** Variasjon mellom tidlig og sen innsjekk i samme arbeidsblokk påvirker meg i**

Velg et alternativ

Eventuelle kommentarer / andre forhold som kan påvirke fravær eller arbeidssituasjon i positiv eller negativ grad:

<< Tilbake Send

100 % fullført

Page 10:

Takk for hjelpen!

Kontakt oss gjerne på stein-christian.andersen@sas.dk for eventuelle sprørsmål.

Med vennlig hilsen
Grete Mogstad og AH Stein-Christian Andersen

Appendix 7: Mail sent to cabin crew in SAS (from SAS)

Title: Masteroppgave ang. cabin crew i SAS

From: (Manger Cabin Safety)
Sent: 27. Januar 2011 10:43
To: *Cabin crew

Cabin Management sender ut denne mailen på vegne av en av våre AH (Stein-Christian Andersen) som skriver en masteroppgave med emne innenfor flybransjen. Vi er opptatt av arbeidsmiljøet og ser dette som en flott mulighet til å kunne se hva som kommer frem i denne masteroppgaven og som vi kan bruke videre innenfor management.
Vi ber dere sette av litt tid og gjennomføre questbacken nedenfor.

Hei!

Økt arbeidspress på crew i flybransjen har vært et omdiskutert tema de siste årene. I den forbindelse skal vi skrive en masteroppgave ved Høgskolen i Molde der vi fokuserer på nettopp dette. Hensikten med denne undersøkelsen er å kartlegge dagens situasjon.

Undersøkelsen vil ta ca fem til åtte minutter å gjennomføre.
Alle svarene du gir vil være anonyme.

Håper du vil hjelpe oss!

Trykk på linken under for å starte undersøkelsen:
https://web.questback.com/gretemogstad/himoldesas/

Med vennlig hilsen
AH Stein-Christian Andersen og Grete Mogstad

Med vennlig hilsen/Best regards

(Manager Cabin Safety)
Cabin Operation OSLOK-S
Scandinavian Airlines
www.sas.no

Appendix 8: Reminder sent to cabin crew in SAS (from SAS)

Title: Påminnelse: Masteroppgaveang. cabin crew i SAS

From: (Manger Cabin Safety)
Sent: 27. Januar 2011 15:00
To: *Cabin crew

Cabin Management sender ut denne mailen på vegne av en av våre AH (Stein-Christian Andersen) som skriver en masteroppgave med emne innenfor flybransjen. Vi er opptatt av arbeidsmiljøet og ser dette som en flott mulighet til å kunne se hva som kommer frem i denne masteroppgaven og som vi kan bruke videre innenfor management.
Vi ber dere sette av litt tid og gjennomføre questbacken nedenfor.

Hei!

Dette er en påminnelse om at vi ønsker din deltakelse på vår spørreundersøkelse angående økt arbeidspress på crew i flybransjen. Dersom du allerede har svart kan du se bort i fra denne påminnelsen.

Dersom du har hatt problemer med å gjennomføre den på et tidligere tidspunkt pga. feilmeldingen du får ved spørsmål om ditt sykefravær, ønsker vi at du tar den igjen. Årsaken til denne feilmeldingen er at du må besvare alle punktene, altså trykke "ikke forekommet" dersom alternativet ikke passer deg.

Undersøkelsen vil være åpen frem til mandag 28/2-11.

Undersøkelsen vil ta ca fem til åtte minutter å gjennomføre.
Alle svarene du gir vil være anonyme.

Håper du vil hjelpe oss!

Trykk på linken under for å starte undersøkelsen:
https://web.questback.com/gretemogstad/himoldesas/

Med vennlig hilsen
AH Stein-Christian Andersen og Grete Mogstad

Appendix 9: Mail sent to cabin crew in SAS and NKF (from NKF)

Title: Medlemsinformasjon 28. januar

From: NKF
Sent: 28. Januar 2011 14:54
To: (members of the union)

(a large part of this e-mail is removed due to internal and unimportant content)

NORSK KABINFORENING

MEDLEMSINFORMASJON 28. JANUAR 2011

MASTEROPPGAVE I LOGISTIKK

I forbindelse med AH Stein-Christian Andersen og Grete Mogstads masteroppgave i logistikk til ved Høgskolen i Molde ble det 27. januar sendt ut en spørreundersøkelse til CC i Norge. Hensikten med denne undersøkelsen er å kartlegge dagens situasjon i forhold til økt arbeidspress på CC i flybransjen, deriblant fravær som oppstår pga. dette. Cabin Management er opptatt av arbeidsmiljøet og ser dette som et bidrag til deres arbeid. Undersøkelsen er anonym og tar fra fem til ti minutter å gjennomføre. NKF oppfordrer medlemmene til å delta.

Vi ønsker medlemmene en strålende helg!

Appendix 10: Reminder sent to cabin crew in SAS and NKF (from NKF)

Title: Medlemsinformasjon

From: NKF
Sent: 18. Februar 2011 14:28
To: (members of the union)

(a large part of this e-mail is removed due to internal and unimportant content)

MEDLEMSINFORMASJON 18. Februar 2011

MASTEROPPGAVE I LOGISTIKK

I forbindelse med vår masteroppgave i logistikk ved Høgskolen i Molde har det blitt sendt ut en spørreundersøkelse til CC i Norge angående arbeidssituasjonen i 2010. Ved å delta på denne har du en super mulighet til å kunne si din mening og komme med eventuelle forslag til endringer angående din arbeidshverdag! Hensikten med denne undersøkelsen er å kartlegge dagens situasjon i forhold til økt arbeidspress på CC i flybransjen, deriblant fravær som oppstår pga. dette. Cabin Management er opptatt av arbeidsmiljøet og ser dette som et bidrag til deres arbeid.

Undersøkelsen er anonym og tar fra fem til ti minutter å gjennomføre. Dersom du ikke har besvart undersøkelsen enda kan du kopiere adressen under og lime den inn i din nettleser.

https://web.questback.com/gretemogstad/himoldesas/

På forhånd takk for hjelpen!

Mvh.
AH Stein-Christian Andersen og Grete Mogstad

Appendix 11: Overview of Cabin Crew in SAS

Table A11.1 (presented on the next page) shows the number of cabin crew divided into different work related characteristics. The numbers are gathered from management in SAS. The sum of the columns *Full time* and *Part time* employees is equal to the column *Total,* while the sum of *60%/80%* and *Resource pool* equal the column *Part time*. The sum of *AP, AS* and *AH* equals further the column *Total*, and the same applies for the columns *Long-haul* and *Short-haul*. The column *On leave* explains the amount of employees which is on some kind of leave at the presented dates. This number is a part of the other ones in the table, which means that the sum of full- and part time employees consists of a fraction of cabin crew that is on leave.

The numbers presented by SAS gives no complete overview of the amount of different categories of cabin crew present at the time of the survey. To circumvent this problem, fractions have been calculated to give an approximate overview of the situation. To explain better; the personnel on leave constitute 19,6% of the total employees per 01.01.2010. It is then assumed that the different categories has 19,6% of the employees on leave, for example 19,6% of the AP's was on leave per 01.01.2010. An overview of cabin crew on leave in the different categories is given in table A11.2.

Base	Total	Full time	Part time	60%/80%	Resource pool	AP	AS	AH	Long-haul	Short-haul	On leave
OSL											
01.01.2010	1207	643	564	411	153	404	86	717	276	931	237
01.01.2011	1035	493	542	415	127	307	90	638	241	794	185
SVG											
01.01.2010	105	41	64	55	9	49	0	56	0	105	18
01.01.2011	76	27	49	42	7	30	1	45	0	76	10
TRD											
01.01.2010	110	43	67	51	16	39	2	69	0	110	17
01.01.2011	107	37	70	55	15	35	2	70	0	107	22
In total											
01.01.2010	1422	727	695	517	178	492	88	842	276	1146	272
01.01.2011	1218	557	661	512	149	372	93	753	241	977	217
Change	-204	-170	-34	-5	-29	-120	5	-89	-35	-169	-55

Table A11.1: Overview of cabin crew in SAS .Source: SAS (2011j)

Base	Total	Full time	Part time	60%/80%	Resource pool	AP	AS	AH	Long-haul	Short-haul	On leave
OSL											
01.01.2010	19,6 %	126,3	110,7	80,7	30,0	79,3	16,9	140,8	54,2	182,8	237,0
01.01.2011	17,9 %	88,1	96,9	74,2	22,7	54,9	16,1	114,0	43,1	141,9	185,0
SVG											
01.01.2010	17,1 %	7,0	11,0	9,4	1,5	8,4	0,0	9,6	0,0	18,0	18,0
01.01.2011	13,2 %	3,6	6,4	5,5	0,9	3,9	0,1	5,9	0,0	10,0	10,0
TRD											
01.01.2010	15,5 %	6,6	10,4	7,9	2,5	6,0	0,3	10,7	0,0	17,0	17,0
01.01.2011	20,6 %	7,6	14,4	11,3	3,1	7,2	0,4	14,4	0,0	22,0	22,0
In total											
01.01.2010	19,1 %	139,1	132,9	98,9	34,0	94,1	16,8	161,1	52,8	219,2	272,0
01.01.2011	17,8 %	99,2	117,8	91,2	26,5	66,3	16,6	134,2	42,9	174,1	217,0

Table A11.2: Overview of cabin crew on leave in the different categories. Source: SAS (2011j)