

# Health Inequalities in Temporary Employment

*A Cross-National Comparative Study of Denmark, Norway,  
and Sweden.*

Abraham Danquah



**Master's Thesis in International Social Welfare and Health Policy**  
**Oslo Metropolitan University**  
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# ABSTRACT

**BACKGROUND:** Health inequalities in temporary employment are of much concern recently due to the adverse effects it could have on an individual's already ill health and the effects on entire society in the form of reduced tax revenue mobilization and the consumption of more health service. Labour market deregulation policies associated with weakened employment protection, has made it relatively flexible for employers to offer temporary work contract. However, the majority of workers are against temporary employment because of the associated job insecurity, lower income, reduced self-worth and social participation. Health inequalities in temporary work contracts in Denmark, Norway, and Sweden are examined in this study. Although these Scandinavian countries share many characteristics, both the prevalence of temporary work contracts and the strength of employment protection differs noticeably.

**OBJECTIVE:** To examine if people with limiting long-standing illness (LLSI) are overrepresented among those holding temporary work contract and whether health inequalities in temporary work contract is more striking in Sweden, where temporary employment is more common than in Denmark and Norway. Furthermore, the current study examines temporary work contract prevalence in Scandinavia among people with specific health conditions.

**METHOD:** The statistical association between LLSI and temporary work contract were analyzed using multivariate linear regression. Temporary work contract, health and other covariates – age, education and gender – were included in an OLS regression model. Moreover, temporary work contract prevalence was examined for six specific health conditions separately, using the same set of sociodemographic control variables.

**RESULTS:** There is a significantly higher likelihood of holding temporary work contract among people who reported LLSI in Sweden, where temporary employment is more prevalent. On the specific health conditions, allergies and severe headache were significantly associated with a temporary work contract in Denmark, whereas temporary work is significantly more common among people with muscular and joint pains in the foot/leg in Sweden. The results overall indicate that people with ill health hold temporary work contracts more often in countries with higher temporary employment rate and weaker employment protection.

**KEY WORDS:** Temporary; Employment; Health; Inequalities; Work; Prevalence; Contract.

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Abraham Danquah

Oslo, November 2018

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## ABBREVIATIONS AND ACRONYMS

ALMPs	Active Labour Market Policies
CST	Core Scientific Team
EPL	Employment Protection Legislation
ESS	European Social Survey
EU	European Union
EU-SILC	European Union Statistics on Income and Living Conditions
FTC	Fixed Term Contract
GDP	Gross Domestic Product
ILO	International Labour Organization
IMF	International Monetary Fund
ISCED	International Standard Classification of Education
LLSI	Limiting Long-Standing Illness
MISSOC	Mutual Information System on Social Protection
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
TWA	Temporary Work Agency

# 1 . INTRODUCTION

Temporary employment has seen an upsurge across many European countries for the past three decades (Eurofound 2016) while health inequalities are also widening in many high-income countries (Burrows 2007). The “number of temporary employees in the EU27 increased by 25% between 2001 and 2012, compared with a growth rate of 7% in permanent employees” (Eurofound 2016). This increment is a concern as most employees prefer permanent employment to temporary employment because of the associated consequences. Holding a permanent employment is vital to health, stable and planned social participation. For workers, temporary employment is associated with a plausible job insecurity which may expose them to a lower quality of life. Although workers termed “free workers” with interest in boundaryless careers may seek temporary employment by choice (Knell 2000, Lichtenstein, Hartwell, and Olson 1998), the majority of workers prefer permanent contract (Ferrie et al. 2008).

Moreover, temporary employment is seen as a strong indicator of precariousness which is associated with worse working conditions compared to permanent jobs. As posited by Standing (2011) taking a temporary job after a spell of unemployment, can result in lower earnings for years ahead. He argued further that “once a person enters a lower rung job, the probability of upward social mobility or of gaining a ‘decent’ income is permanently reduced” (Standing 2011, 15).

There is, therefore, an increasing concern regarding the health and quality of life of temporary workers (Virtanen et al. 2005, De Cuyper et al. 2008). Also, Wallete (2005), noted an adverse relationship between poor health and the chance of moving into permanent employment through on-the-job training. One reason for a firm to offer on-the-job training for temporary employees is the possibility of inducing self-selection among workers. Thus, doing well in this kind of training increases the permanent employment chances of an employee. However, high-ability (e.g. people with good health) may have advantages over low-ability workers (e.g. people with ill health), thus, increasing the probability of low-ability workers remaining in temporary employment (Wallete 2005). Thus, health inequalities are likely to rise with increased temporary employment.

Health inequalities in temporary employment represent a challenge in two ways. First, the inability to hold on to a job permanently affects the individual himself or herself, because it reduces income, and thus self-worth, and social integration and participation. For many

employees, temporary employment may be a “*stepping stone down* into a lower income status as taking a temporary job after a spell of unemployment, as urged by many policymakers, can result in lower earnings for years ahead” (Standing 2011, 15). Also changing jobs from one spell of temporary employment to another may require leaving one place of residence to another. Many employees find it difficult relocating because of family responsibilities such as care for children who are often locked up in school trajectory and care for elderly relatives (Standing 2011).

Secondly, the entire society could be affected in the form of less tax revenue mobilization. This could worsen if health deteriorates and results in the use of more health services and medicines, and the reliance on sickness benefits or unemployment benefits which are even far worse to the national economy. It is therefore highly desirable to examine the prevalence of temporary employment among people with ill health and possibly move them to a more stable employment.

To this end, there is a need for improved labour market attachment (permanent employment) for the benefit of the entire society in terms of improved tax mobilization and sustained social security systems. Labour market deregulation has been suggested as a promising tool to improve labour market attachment among vulnerable groups (IMF 2013). The Danish flexicurity model with rules that makes it relatively easy for employers to dismiss and hire new employees, is one such labour market deregulation policies. In accordance with this suggestion, several European countries have since the 1990s put into effect deregulation measures (Gebel and Giesecke 2016).

The two main instruments for labour market deregulation are weaker employment protection legislation (EPL) and the use of more temporary work contracts.

Employment protection refers both to regulations concerning hiring (e.g. rules favouring disadvantaged groups, conditions for using temporary or fixed-term contracts, training requirements) and firing (e.g. redundancy procedures, mandated prenotification periods and severance payments, special requirements for collective dismissals and short-time work schemes) (OECD 2017).

Temporary work contract also refers to job contracts with a predetermined termination date. Thus, the employee is not assured of any future employment after the contract expires. Another outcome of labour market deregulation advocacy is the growth in temporary work agencies that employ and hire employees to companies (user companies) on a temporary basis. Temporary work agency aims at bringing people into work, thus, reducing unemployment and acting as a

step up for further employment. The key idea behind temporary agency work is flexibility for the employee and the worker (ILO 2013).

EPL and temporary work relate in two ways. On the one hand, Strict EPL makes hiring and firing difficult because of the legal and financial implications. Thus employees (permanent and temporal) are more protected under strict EPL. However, strict EPL is blamed for the higher unemployment rate, especially among the labour market outsiders such as the youth. On the other hand, weaker EPL gives employers the flexibility to hire and fire workers without the fear of dismissal cost. Proponents of labour market deregulation argued that weaker EPL will allow outsiders access through temporary work contract which can serve as a stepping stone into permanent employment.

Labour market segmentation offers a counter-argument to the claims of labour market deregulation. Proponents of this theory accentuate that deregulation could lead to a further polarization of the workforce thereby widening the insider-outsider gap. For instance, individuals possessing an ‘uncertain signal’ (poor health) could be trapped in a vicious circle consisting of temporary work contracts and repeated unemployment episodes. Moreover, the flexibility to offer temporary work contracts, could make temporary employment more relevant and replace the offer of permanent full-time jobs (Pirani and Salvini 2015a). This perspective is supported by recent studies showing that labour market flexibility caused an increase in the rates of temporary work among youth in Europe but did not reduce their unemployment likelihood (Barbieri and Cutuli 2016, Noelke 2016, Gebel and Giesecke 2016). These findings are contrary to the notion that temporary employment could serve as a ‘stepping stone’ into permanent employment for younger workers.

Furthermore, though weaker EPL could enable employers to fire older and less productive workers and thus, increase the accessibility of labour market outsiders, it could also make it relatively easier for employers to take chances on these same labour market outsider particularly the youth and people with ill health. Temporary work contract act as a kind of prolonged probationary period for employers to screen and assess the temporary employee accurately before deciding on giving a permanent work contract (Gebel 2010). Thus, employers may offer permanent contracts after a period of screening. With this laxity of a probationary period, people with ill health could be affected as employers are more likely to observe their health conditions, which can influence their decision to either hire them permanently or keep them in temporary employment. This is supported by recent studies with evidence that people with ill health struggle

to gain a firm attachment to the labour market in Denmark, where employment protection is quite weak (Heggebø 2015; Heggebø 2016; McAllister et al. 2015). It is therefore imperative to do further investigations into whether people with bad health are over-represented in precarious work, particularly temporary employment.

Studies on employment and health usually take two dimensions – health selection and social causation. Social causation studies focus on the health effects of employment (Webber, Pacheco, and Page 2015, Kawada 2015, Menendez et al. 2007, Pirani and Salvini 2015b, Virtanen et al. 2005, Waenerlund, Virtanen, and Hammarström 2011). Health selection rather dwells on the impact of one's health status on their chances of entering the labour market, and whether employment contract changes could be predicted by workers health status (Virtanen et al. 2005, Wagenaar et al. 2012b, Webber, Pacheco, and Page 2015). Some studies on health selection highlight the possibility that people with ill health would be more attached to the labour market in countries with high employment protection legislation (Heggebø 2016, McAllister et al. 2015).

However, the inequalities in temporary employment resulting from health, especially of people with specific health conditions, across geographical space is less considered in literature. But understanding the nature of the relationship between health and temporary employment is crucial as the conditions of people with poor health could deteriorate further if they are exposed to less secured employment (Wagenaar et al. 2012a).

This study, therefore, examines inequalities in temporary employment among people with ill health - operationalized as limiting long-standing illness (LLSI) - in Denmark, Norway, and Sweden. A review by Hardy and Walker (2003) explains temporary work to encompass any job that deviates from the definition of permanent employment, in that it is not continuing, and it does not necessarily go on for the full year (Campbell, 1994). This definition of temporary work covers seasonal, contract, casual work, and all of these can, in a variety of ways, be described as precarious. However, the level of precariousness could differ among these type of contracts (Webber, Pacheco, and Page 2015, Walette 2005). These important distinctions were not spelt out in the current study due to data limitations. Temporary work in this study used the all-encompassing definition - contracts of limited duration that ends automatically after their expiry (see methods section for further information).

Norway, Denmark, and Sweden share many similarities. These similarities in the countries make comparison possible from a substantive point of view. They are often classified within the social

democratic regime in the Esping-Anderson's "Welfare State Regime" (Esping-Andersen 1990, 28). The principles of universalism that characterizes social democratic regime include defamiliarization and decommodification. Universal in the sense that benefits are not restricted to people with a low level of income or other socioeconomic resources (i.e. targeted benefits). Decommodification refers to the level of protection from total dependence on the market while defamiliarization is concerned with how to do without depending on the family. Social policies such as child benefit, health care, and sickness benefits are universally available. Moreover, these countries spend quite substantially on welfare – funded through high tax levels.

Universal access to health care is the underlying principle in the health laws of these countries. Governments are obliged to provide health care to population regardless of socio-economic differences such as age, sex, gender, and educational level. Health care is hugely funded by the respective governments with 84.2 %, 85% and 83% total health funding from government in Denmark, Norway, and Sweden respectively (The Commonwealth Fund, 2016). Representing about 10.6% of GDP in Denmark in 2015, 9.9% in Norway in 2015, and 11% in Sweden in 2014 (The Commonwealth Fund, 2016). In addition, all children below 18 years who live in these three countries qualify automatically for child benefit or allowance. The percentage of public spending on health represented 10.6% of GDP in Denmark in 2015, 9.9% in Norway in 2015, and 11% in Sweden in 2014 (The Commonwealth Fund, 2016). All the three countries spend quite substantially on welfare programmes. Social expenditure in percentage of GDP in 2016 was 28.7% in Denmark, 25.1% in Norway and 27.1% in Sweden (OECD 2016). Social expenditure encompasses public expenditure on old-age, disability and sickness cash benefits, and the expenditure on the family.

Respondents in the study samples, thus, live in countries with similar economic indicators, minimising social-economic and cultural differences. In contrast, it is not straightforward to compare countries with enormous dissimilarities in welfare state arrangements and labour market structure (Heggebø 2016). As the indicators may vary from country to country, findings could be confounded making research outcome less reliable.

While the countries selected for the analysis share common features, there are two significant cross-national differences that are important in analyzing the health inequalities in temporary employment. Firstly, the temporary employment rate differs between the three countries. The percentage of temporary employment as a percentage of total employees in 2015 was 7.7, 7.1,

and 14.9 in Denmark, Norway, and Sweden respectively (Eurostats 2017). Though Denmark is noted for flexibility in employment (Ministry of Foreign Affairs 2017), temporary employment is higher in Sweden than Denmark. This is attributed to changes in Swedish policies over time - allowing more flexibility in the labour market (McAllister et al. 2015). The number of temporary contracts in Sweden increased tremendously from 150,000 to 560,000 between 1990 and 2001 but with a simultaneous decrease of 400,000 in open-ended jobs (Walette 2005). The percentage difference between Denmark and Norway is not too wide. Secondly, employment protection legislation (EPL) on temporary employment also differ, Norway (3.42) with more restriction, followed by Denmark (1.79) and Sweden (1.17) (OECD 2017) with the lowest restriction temporary employment. It should be noted, however, that the OECD measure is a summary measure and there are some nuances in temporary employment that might not be captured in these indexes. An example is the skill component of the Danish Labour market system (see section 4.2 for further details).

As stated earlier, EPL measures the strictness or otherwise of employment regulations – the difficulty or ease to hire and fire employees. Therefore, higher EPL in Norway implies difficulty in firing employees in Norway than Denmark and Sweden. The EPL indicator in Denmark also implies a relative difficulty to fire workers in Denmark than Sweden (This should be considered in light of the weaknesses in the OECD EPL indicators mentioned above). However, with lower EPL, Sweden has more flexibility to hire and fire employees. This also allows employers in Sweden more flexibility to assess the suitability of employees before they enter permanent employment. EPL is of concern when considering the employment of people with ill health as they may be victims to laid-off or more likely to hold on to temporary employment because of their health status. The ill health conditions of such employees may thwart their abilities to meet employers' requirements that could help them enter permanent employment.

To regulate temporary employment in Sweden, several amendments were introduced in the Employment Protection Act (LAS) in 2007, including e.g. that a substitute employee has the right to an open-ended employment after two years (Swedish Government 2006/07:111). However, other forms of temporary employment such those with predetermine termination contracts and on-call employment, were not considered in the amendments (Eurofound 2010). Thus, employers still have the flexibility to offer temporary work contracts which they can offer instead of employing as a substitute. The Working Environment Act in Norway has also been altered to allow for the use of more temporary employees in the Norwegian labour market. The amendment



which effective as of July 1, 2015, took a large step towards the Swedish model that has allowed the use of more temporary work (McAllister et al. 2015, Walette 2005 ). In 14-9 (section F) it is clearly stated that: “temporary appointment agreements may apply to a maximum of 15 per cent of the employees in the business” (The Working Environment Act 2017, 71).

Results from the study will, therefore, be juxtaposed with the current debates in Sweden and Norway on the rise or possible future rise in temporary work contracts. In Sweden, there are calls by the labour unions for a revised LAS in which full-time and open-ended employment should be the normal form of employment. Other forms of employment need special grounds to be accepted (Eurofound 2010). Similarly, there are current proposals in Norway that seek the amendment of the Working Environment Act to restrict temporary hires and project the offer of permanent, full-time employment (Garza 2018). The aim is to make full-time positions associated with predictable pay and working conditions the standard in Norwegian working life. This is geared towards secure work and everyday life for workers, and to remove illegal hiring (Garza 2018).

The need to tighten rules on temporary work contract will be of much concern if it turns out in the current study that there are health inequalities in temporary employment. Knowing that a significant number of people with ill health are temporarily employed, for instance, could be a concern for labour market policy decision making in any of the countries and for quick amendment of the Working Environment Act in the case of Norway.

The primary function of this cross-sectional comparative study is to answer the following research questions:

1. Are people with ill health overrepresented among those holding temporary work contracts?
2. Is there an interplay between ill health and age, education, and gender on the likelihood of holding temporary employment contract?
3. Are people with ill health more prone to holding a temporary work contract in Sweden where temporary employment is more common compared to Denmark and Norway?

## **1.1 Objective of the Study**

The main aim of this thesis is to examine the influence of health on temporary employment prevalence in Denmark, Norway and, Sweden. People with limiting long-standing illness (LLSI) is the primary focus but other health indicators such as self-rated health will be used as well. Self-rated health measure was mainly for robustness check. The study will describe the most important policies relating to health and employment in the three countries comprehensively. Socio-demographic characteristics such as age, sex, and educational status will be deployed to explain possible variations in health-related temporary employment. Finally, some specific health conditions would be examined to highlight their impact on temporary contract prevalence.

Health-related temporary employment prevalence will be analyzed using Ordinary Least Square (OLS) regression model. I will start the analysis with a description of the relationships between age in years, sex, and educational level and temporary employment. This will be followed by a thorough analysis of the relationship between health and temporary work contract prevalence as compared to people with a permanent work contract in Denmark, Norway, and Sweden.

## **1.2 Data and Methodology**

Data for this study was from the European Social Survey (ESS) round 7 (2014). The European Social Survey (ESS) is a cross-national survey across Europe. The surveys are face-to-face interviews that are conducted biannually with newly selected cross-sectional samples (ESS 2017). The ESS survey measures the attitudes, beliefs, and behaviour patterns of diverse populations in more than thirty nations with the main aim of “charting a stability and change in social structure, conditions and attitudes in Europe and interpret how Europe’s social, economic, and moral fabric is changing” (ESS 2017).

Round 7 of the ESS data was used for the analysis because of the specific health conditions measured. The aim is to help researchers examine and compare the impact of different European policy measures on health and health inequalities more specifically and extensively with the round 7 than the previous rounds (ESS 2017b). This gave me the opportunity to measure the prevalence of temporary employment among people with specific health conditions. The data material is well suited for the study, as it allowed cross-national comparison of health status and employment contract type. Age, gender, and educational level were used to analyze health-

related temporary employment prevalence. All analyses were run separately for the three countries.

An initial descriptive assessment of the data was performed followed by multivariate OLS regression analyses to examine the statistical association among the variables. The models investigated health-related temporary employment prevalence in the three countries based on the research questions.

### **1.3 Thesis structure**

The introduction included a brief description of the relations in health and temporary employment with emphasis on debates regarding policies on temporary employment and their possibilities of increasing temporary work prevalence among people with LSLI. Chapter two focused on the review of previous studies on labour market flexibility, health and temporary employment. This is followed by the theoretical foundation in chapter three. Chapter four highlights the similarities and differences in labour market developments in the Denmark, Norway, and Sweden and their potential effects on health-related temporary employment prevalence. Data and methods used for the analyses are covered in chapter five, and the results in chapter six. The paper then ends with discussion and conclusion as chapter seven and eight respectively.

## 2 . PREVIOUS RESEARCH

This chapter focused on previous researches that examined the effect of ill health on the possibility of being selected into temporary employment (health selection) and the effects of holding temporary work contract on health (social causation). Labour market deregulation and its role in temporary employment rise is also discussed in this chapter.

### 2.1 Labour Market Deregulation and Temporary Employment.

EPL, defined as all types of employment protection measures that set out the legal and financial implications for hiring or firing employees is often blamed as the cause of high unemployment levels if it is too stringent (OECD 1999). In view of this, there are calls for the deregulation of the labour and make EPL weaker. Labour market deregulation is a “strategy to remove institutions of labour market regulation and reduce legal intervention in the relationship between employers and individual to a minimum” (Eurofound 2017). This view is supported by leading sociologist and economists (Blau and Kahn 1999, Esping-Andersen and Regini 2000, Boeri and van Ours 2013) and influential organizations (OECD 2012, European Commission 2006, World Bank 2007). For instance, the IMF (2013) has argued that

*employment protection decreases the risk of unemployment for those employed, it also decreases the ability of firms to adjust employment, thereby increasing their costs, even given wages. And because it reduces the risk of being laid off, employment protection reinforces the bargaining power of employed workers and hence may also increase wages. Higher costs lead to lower hiring and thus to higher unemployment duration.*

Weaker employment protection that makes it flexible for employers to hire and fire employees has been suggested as a means of reducing unemployment. The proposal is that workers should be protected by means of unemployment insurance when they are laid off. Thus, for the labour markets, — “protect workers, not jobs” should be the right motto (IMF, 2013).

However, there is a body of research suggesting that weaker employment protection has not reduced unemployment but had rather resulted in an increased in the use of temporary employment contracts (Gebel and Giesecke 2016, Gebel 2010, Pirani and Salvini 2015b) In a review of theoretical and empirical research using conventional regression analysis and difference-in-difference analysis, there was no “consistent evidence” linking strict EPL to

inferior youth labour market performance (Noelke 2016). Deregulation of employment rather leads to an increased temporary employment rate among the youth without any progression into permanent employment. This was so for all education groups and institutional conditions tested. Thus, the youth who are an example of an outsider group on the labour market (because of their young age and the lack of experience) end up in temporary and insecure jobs.

Barbieri and Cutuli (2016) revealed that compared to unemployment, temporary employment plays a reducing role in the risk of subsequent unemployment. This implies that people who were previously temporarily employed have a greater chance of re-employment than the unemployed who are entering the labour market for the first time. However, they could not confirm the “integrative effect” of temporary employment as a stepping stone towards stable/permanent employment in the labour market (Barbieri and Cutuli 2016). Results from a study by Gebel and Giesecke (2016) using micro-data analyses for 19 European countries from 1992 to 2012, showed that deregulating the use of temporary contracts increased temporary employment risks instead of reducing unemployment among the youth.

The above studies contrast the view that rigid employment protection leads to higher unemployment levels. The studies rather find an increasing use of temporary employment without any prospects of the temporary employed gaining permanent employment. Also as noted by Lansbury (Burgess and Connell 2004), there is a paradigm shift in the kinds of work covered by temporary employment. Temporary employment now covers professional areas such as teaching and nursing instead of the traditional areas such as seasonal jobs and jobs of uneven demand such as building and construction. It is therefore imperative to examine whether people with ill health are overrepresented among those holding temporary work associated with this soar in temporary employment over the years, carving out the differences in the effects based on the differing EPL and labour market policies the different countries.

## **2.2 Methods in Literature**

Studies on employment type and health are usually observational studies with data from registers and surveys (observational data) – using longitudinal or cross-sectional study design. Observational data refers to secondary data from surveys and registers. An observational study also called a nonexperimental study, allows the researcher only to observe the data (Melissa 2014). This means that unlike experimental study, there is a lack of randomization into treatment group and control groups. The experimental study allows the researcher to control the statistical

sample and randomly assign the treatment group – creating a randomised treatment and control sample. Selection problem – the influences of personal characteristics and the settings of the individual in sampling – is eliminated in well-executed experimental studies.

Though regarded as the most robust form of evaluation, experimental research is not feasible for all studies (Melissa 2014). Also, experimental research creates validity problems – internal validity and external validity. The artificial environment in experimental studies may influence the answers a participant gives, thus, creating doubts about the internal validity of the research. The generalizability of the research findings (i.e. external validity) might also be questioned due to the potential influence on the answers the respondents give.

An observational study is appropriate in situations where the researcher wants to analyse relations in concepts using a larger sample size in the natural environment of the respondents. Though selection problem is an issue in an observational study, this could be minimized by following the etiquettes regarding survey and registry data collection and by following a systematic data analysis using high-quality statistical packages. For instance, there are laid down sampling procedures by the ESS for gathering the survey data that was used for the current study. The ESS follows rigorous sampling and data collection principles to reduced selection bias to the barest minimum and thus make the data that the member countries present as reliable as possible (ESS-Sampling 2016).

Survey data is collected from a sub-part of the population, and the data is used to examine the characteristics of the whole population. In this regard, the sample must be representative of the population in question. A register is a database containing information on a complete group of units, for instance, a register containing information on a country. Survey data was employed in this study as it is basically the only option for cross-national comparative studies on health and temporary work. As noted by Virtanen et al (2005) random sample from the whole population is the best in terms of the generalizability of the results to the total workforce of a given country. The data from ESS captures both health and employment contract variables that suits a cross-national comparative analysis of health and temporary employment with a cross-sectional study design. Also, there is no panel data material with the specific health conditions as captured in the ESS data. The EU-SILC, for instance, captures only general health indicators.

### **2.2.1 Longitudinal Studies and Cross-sectional Studies**

Longitudinal studies use repeated measures to follow a sample of individuals over periods of time. Longitudinal studies that are observational in nature, use quantitative and/or qualitative data, that is being collected on any combination of exposures and outcomes (Caruana et al. 2015). This study type is particularly useful for examining cause-and-effect relationships and the outcomes of treatments over different lengths of time. Thus, longitudinal studies are suitable for examining the impact of health on temporary employment. Additionally, these studies can be employed to highlight health selection and temporary employment using the appropriate statistical testing to analyse changes over time.

Cross-sectional studies analyse multiple variables at a given instance. Being static, cross-sectional studies provides no information with regards to the influence of time on the variables measured (Caruana et al. 2015). It is also difficult to establish causal relationships using cross-sectional studies. However, with propensity score methods, cross-sectional studies can be used to make causal inferences. Lanza et al (2013) define propensity score methods as a conceptually straightforward approach to drawing causal inferences from observational data. Cross-sectional studies on employment type and health mostly focus on the prevalence of temporary employment among people with good health and ill health.

The literature on both longitudinal and cross-sectional studies on employment type and health are relevant for this study as the aim is to examine the prevalence of temporary employment among people with ill health as compared to good health and not necessarily to debate on whether temporary employment causes poor health or poor health leads to temporary employment. I assume that both instances can lead to a higher prevalence of temporary employment among people with ill health.

## **2.3 Health and Temporary Employment**

Studies on the relationship between health and temporary employment basically focus on two dimensions – social causation and health selection. Temporary employment among people with ill health is either a result of social causation (Waenerlund, Virtanen, and Hammarström 2011, Dawson et al. 2015) or health selection (Heggebø 2016, Webber, Pacheco, and Page 2015). The social causation hypothesis asserts that experiencing temporary employment increases the risk of illness. Thus, temporary employment is the causal factor of ill health. Health Selection, on the

other hand, refers to the probability of employers offering temporary employment to people with ill health. Health selection studies highlight how people with poor health may either not be selected for employment or maybe employed temporarily. As employers may be sceptical about their productivity level, people with ill health might be employed temporarily to assess their abilities before any possible permanent employment offer. Ill health could be a disadvantage in situations where there is a higher competition on the job at hand – the employer may prefer to employ people with good health.

### **2.3.1 Social Causation Studies**

A longitudinal study in northern Sweden by Virtanen, Waenerlund, and Hammarstrom (2011) found a higher risk of both non-optimal self-rated health and psychological distress among temporary employees. They concluded that temporary employment may have adverse effects on self-rated health and psychological health after adjusting for previous health status and sociodemographic variables. The study also highlighted the impact of cash margin and job insecurity in the health of the temporary employed. They indicated that low cash margin and low job insecurity partially mediate the association between temporary employment and health status. Workers on a temporary contract with an assurance of job security and better salary reported good self-rated health and psychological well-being. This reiterates the fact that job insecurity is a major concern for temporary employees. A cross-sectional study in Sweden also showed an increase in the likelihood of distress among the temporarily employed (Sidorchuk et al. 2017).

In addition, a study in the Netherlands by Kompier, Janssen, and Taris (2009) highlighted the difference between contract types and quality of working life. Longitudinally, they found evidence that a positive change in employment type was associated with better quality of working life, whilst a negative change results in poor quality of working life. They advocated for a special attention for temporary agency workers and on-call workers through job design and human resource management (Kompier et al. 2009). The cross-sectional aspect of the study by Kompier et al (2009), showed that permanent employees generally had better job characteristics, whereas temporary agency workers and on-call workers had more 'bad work characteristics' such as decrease supervisory and collegial support, less work engagement, and less contractual hours (Kompier et al. 2009). They also found differences in the health behaviour and psychological health of temporary employees and permanent employees in the Netherlands. Smoking and psychological health were worst in temporary agency workers because of temporary job



associated stress. Temporary agency workers (30.4%) and on-call workers (30.2%) were more often smokers than permanently employed workers (25.3%).

Moreover, Pirani and Salvini (2015) found a negative association between temporary employment and health in a study in Spain. This they argue was from a “statistical causal effect in the work-to-health direction and does not derive from a selection of healthier individuals in the group of people who find permanent jobs (selection effect)” (Pirani and Salvini 2015b). In addition, they highlighted the influence of time on the health of the temporary employed. They noted that the health of the temporary employed deteriorates over time. However, the study did not delve into the health of workers before their temporary job offer. Nonetheless, if health deteriorates with temporary employment, then people with ill health before entering temporary employment may be more affected.

Furthermore, a study in Italy by Minelli, Chiavarini, and Bartolucci (2014) revealed that temporary workers report ill health more often than permanent employees. This pattern was mostly found among males, and young workers, with the main conclusion being that there is a great difference in health inequalities between permanent workers and temporary employed (Minelli et al. 2014). Thus, temporary employment was associated with more health problems than permanent employment.

A systematic review by Bernavides et al (2001) in 15 European countries, found evidence of a positive association between temporary employment and job dissatisfaction. Physical ailments such as fatigue, backache and muscular pains also tended to be positively associated with precarious employment (Benavides et al. 2000). Ferrie et al (2008) found strong evidence of adverse effects of job insecurity on psychological health and self-reported physical health, workplace injuries and accidents, sickness absence, and health service use. A systematic review by Virtanen et al (2003) suggested a higher psychological morbidity, higher occupational injuries among temporary workers compared with a permanent employee. They concluded that there is an association between temporary employment and ill health, depending highly on the instability of temporary employment and the context (Virtanen et al. 2003).

### **2.3.2 Studies on Health Selection**

Virtanen *et al.* (2005) emphasised the need for future work to investigate health status as an antecedent since many dual labour market theorists argue that those who are healthy are selected

for core jobs, while those who are not, are selected for periphery jobs. Core jobs are central to organizations and require higher levels of job-specific skills, pay and job security than jobs in the secondary segment. These latter jobs are more peripheral and more precarious, with lower levels of training and skills, less pay, a less attractive job content and worse working conditions, and less job security (Kompier et al, 2009). Based on this recommendation Webber, Pacheco, and Page (2015) studied how health issues – mental and physical health - may inhibit active participation and attachment to the labour market. They found that “being in physical pain does not influence employment propensity but does reduce the probability of being in full-time or permanent employment, with such people being more likely to work casually” (Webber, Pacheco, and Page 2015). This implies that a greater number of people with ill health may end up in temporary employment and those with good health permanently employed, somewhat confirming the dual labour market theorists which argue that people who are healthy are selected for core jobs, while those who are not, are selected for periphery jobs (Hudson 2007).

The previous studies reviewed contributes to the possible impact of both social causation and health selection factors on temporary employment. However, most of the studies were country-specific and did not look at temporary employment across geographical space to examine the effect of the differences in labour market policies on health and temporary employment in different country settings which is the focus of this study.

## **2.4 Limiting Long-standing Illness (LLSI) and Temporary Employment – The Scandinavia Context**

This section focused on studies on employment and limiting long-standing illness (LLSI). The section highlighted on LLSI since it is the main health measure in the current study. LLSI captures quite serious health conditions that could probably be noticed by employers as compared to less serious health conditions.

Only a handful of studies have specifically examined labour market policies and employment rates among people with limiting longstanding illness (LLSI) (McAllister et al. 2015, Heggebø 2015b, 2016). McAllister et al (2015), analysed employment rates among people with limiting long-standing illness and low education in Denmark, Netherlands, Sweden and the United Kingdom. They noticed a decline in EPL policies in all the four countries. They argued that a decline in employment protection may be detrimental to people with ill health (especially chronic

illnesses) in the long term (McAllister et al. 2015). These policies may allow employers to easily dismiss or keep people with ill health on a long probationary period, and thus keeping them longer in temporary employment. Comparing employment rates in Denmark and Sweden, they found that Swedish policy, with higher employment protection and higher economic security, led to higher employment rates among the LLSI group. However, they suggested further examination of the recent policy changes in Sweden and their relations on employment. An area this study will explore to examine the effects of these policies changes on inequalities in temporary employment.

A study on hiring, employment and health in the Scandinavia by Heggebø (2016) also found evidence of roughly 50% higher likelihood of people reporting ill health to have temporary work contract compared to people with good health in Sweden (vs Denmark and Norway). Two health measures – limiting long-standing illness (LLSI) and self-rated health – were used in the study, and temporary employment prevalence among ill health was higher on both measures in Sweden. In Norway, people reporting ill health – on both measures – have the same prevalence of temporary employment contracts as those with good health. He also observed that temporary employment was approximately higher among people who reported subjective ill health (7%), and those who reported LLSI (10%) than those who reported good health (4.5%) in Denmark. This implies that ill health is quite related to temporary employment in the three Scandinavia countries.

The above studies, however, focus much on hiring, general employment, and LLSI. Much attention was not paid to two major issues. Firstly, there was a lack of evidence on the interplay of sociodemographic variables on temporary employment. For instance, the interaction effect of the level of educational and ill health on temporary employment. Same applies to the interplay of other variables such as age or gender and health on temporary employment. Though the study of McAllister et al analysed these interplays, they focused on general employment and not on temporary work contracts.

Secondly, the health of people reporting LLSI was considered in general without highlighting specific health conditions. This study will examine specific health conditions that are over or under-represented by temporary work contracts in differing institutional and legislative settings. i.e. Denmark, Sweden, and Norway. Health conditions such as back and neck pain, severe headache, muscular and joint pain in the foot or leg, muscular and joint pain in the arm or hand,

allergies, and digestion and stomach related conditions were considered to estimate their relations to temporary work contracts.

## **3 . THEORY**

There are at least three possible interrelated mechanisms for explaining the possibility of selecting or maintaining people with ill health to temporary employment and thus increasing health-related temporary employment inequalities. The first is the proxy for productivity. Second is the profit maximising objectives of employers, and lastly, employers may discriminate against people with poor health.

### **3.1 Proxy for Productivity**

Employers always desire to offer employment to people who are the most efficient and productive at work. Employers may, therefore, select employees who are fit to work and either disregard those with poor health or alternatively employ them temporarily. Moreover, to avoid the problem of employing people with unknown health status, employers tend to employ workers on a temporary basis and decide to retain them permanently based on their productivity level. And since measuring productivity of workers is cumbersome, employers may turn to visible signals such as a number of sick days in their attempt to move an employee from temporary status to permanent status or in a worst case lay an employee off (Heggebø 2015a).

Furthermore, employers who are risk averse (those who do not like to take any risks) may be sceptical about the productive ability of people with ill health because (i) of the fear of high sick absence, (ii) they might deteriorate further in health, perhaps to the extent that they may resign, with its implications for a new time consuming and expensive recruitment process for employees (Heggebø 2015a). Hence employers will employ on a temporary basis to (i) assess the productivity level and (ii) ascertain if employees have any health problem that can hinder productivity. Thus, employers have good and rational reasons for being sceptical towards people with ill health.

### **3.2 Profit Maximizing Motives of Employers**

Employers are profit maximizing, and therefore will exploit opportunities that will reduce spending on employees. They will, therefore, prefer temporary employment because of the associated lower wages, avoidance of experience-rated pay, and less entitlement to enterprise benefits. Employers owe it a duty to pay employees initial sickness benefit for a period of time before welfare organizations continue with benefit payment. In Denmark, employers pay from

the first day of absence to the 30<sup>th</sup> day of sick leave (MISSOC 2018). Employers pay sickness benefits for the first 16 calendar days in Norway and employers pay sickness benefits for the first 14 days in Sweden (MISSOC 2018). Employers are likely to pay less of such sickness benefits for the people holding temporary work contract because they may not qualify for the amount that a permanent employee will take.

The profit-maximizing theory is in line with the “healthy-worker effect” theory that postulates that healthy workers go “up” in employment status whereas less healthy workers go “down” into or remain in precarious temporary employment or unemployment (Wagenaar et al. 2012b). According to Wagenaar et al (2012) workers with lower health, lower work-related well-being, or lower workability are at risk of ending up in precarious temporary employment or unemployment (Wagenaar et al. 2012b).

If employers are profit maximizing, people who reported ill health are more likely to hold temporary employment and more so in Sweden where the temporary employment rate is higher. The prevalence could be higher among the unskilled labour force in Denmark who are less protected when compared to the skilled or salaried employees.

### **3.3 Economic Discrimination**

The theory of Economic discrimination (Becker 1971 ) also provides reasons why the less healthy maybe employed temporarily. Economic analyses focused on two models of discrimination; taste/preference-based and statistical models of discrimination. On the one hand, preference-based discrimination is when employers place disamenity value on employing minority workers (David 2003). Though the allocation of jobs and resources in a free labour market are determined by supply and demand (Webber, Pacheco, and Page 2015), some employers may expect compensation from minority workers by accepting low wages and being more productive at work or they may be willing to lose money in order not to hire people they disapprove of.

Statistical discrimination, on the other hand, is based on the premise that firms have limited information on the skills of job applicants. This might give them an incentive to base their recruitment decisions on easily observable characteristics such as race, previous employment, gender, sex, and health status to infer the expected productivity of an applicant (Webber, Pacheco, and Page 2015). Employers may discriminate against people with ill health either because they dislike people who are unfit, or because they believe that health is correlated with

undesirable personality characteristics. However, instead of not employing people with ill health, they will be employed temporarily to enable employers to assess their productive abilities before they decide on permanent employment. Moreover, employers will see the temporary employed as unfit when they have gone through several episodes of temporary employment and unemployment.

### **3.4 Testable Predictions**

This section outlines the testable predictions about the data based on the theories discussed in this chapter. Due to the proxy for productivity and the profit-maximizing intents of employers, my main hypothesis was that temporary employment prevalence may be quite high among people with LLSI. This would be determined using temporary employment prevalence among people with specific health conditions. I argued that specific health problems, such as allergies, neck and back pain, muscular and joint pain in the arm/hand, muscular and joint pain in the foot/leg, severe headache, and stomach and digestion related conditions that reportedly hampered the daily activities of employees, may be seen as likely productivity impediments. If that is the case, then temporary contracts will be over-represented by people who are hampered by this specific health condition as employers may be tempted to employ temporary to access productive capacities of such workers. Or employers might be sceptical in transiting such workers from temporary contract to permanent contract. Thus, people with ill health are more likely to remain in temporary employment if employers are more worried about production and profit maximization.

On the other hand, people reporting that their health conditions did not hamper their daily activities – health conditions unrelated to productivity - are more likely to report lower temporary employment prevalence. Thus, the concealed nature of their conditions may be an advantage that may increase their chances of landing on a permanent work contract. However, because of the flexibility of hiring and firing, employees whose daily activities (productivity) were initially not hampered by health could see their health deteriorate and become more observable to employers and thereby increase the likelihood of them remaining in temporary employment. This could also be a contributory factor for higher temporary employment prevalence among people with ill health in a country with less rigid labour market regulation.

Secondly, the prevalence of temporary employment among people with ill health might be higher in Sweden where temporary employment rate (14.9) is higher, followed by Denmark (7.7) and Norway (7.1) (Eurostats 2017). Moreover, with weaker EPL for temporary employment,

employers in Sweden (1.17), employers can hire and assess the performance of employees on a temporary basis with flexibility than in Denmark (1.79) and more especially in Norway (3.42) (OECD 2017b). Also, temporary employment rates among people with good and ill health may be higher among younger employees in all the three countries because of their relatively less labour market attachment.

It should be noted that there are people who prefer temporary employment to permanent employment due to their desire to explore the different working environment and increase their expertise. Such people may be healthy but may choose temporary work contracts. In that case, though temporary employment may be higher in an institutional setting, it might not necessarily be over-represented by people with ill health.



## **4 . CROSS-NATIONAL DIFFERENCES**

The three Nordic countries share similar economic, social and health policies. They all rely on taxes to finance health, education, employment and child policies. Education is, therefore, free or heavily subsidised. Health care is provided on a universal basis making it accessible to all the people living in these countries. In addition, the countries place much importance on work and employment as particularly important mean for integration and social participation (Lødemel and Trickey 2001, Bengtsson 2014). The study, thus, involved respondents who live in countries with comparable characteristics, minimizing socio-economic variations greatly.

The portion of employees in the public sector is comparable in the three countries: 29.1% in Denmark, 30.0% in Norway and 28.6% in Sweden (OECD 2015). Overall, the industries of the three Scandinavian labour markets are very similar (Nordic Statistical Yearbook 2014). Furthermore, all three countries have labour market policies such as unemployment benefits, sickness benefits, and disability benefits that assist their population to survive difficult socio-economic conditions. Though there are some differences in the eligibility criteria and the implementation routes of these policies, the overarching aims of these policies are the same in the three countries.

In spite of these similarities, there are two potential cross-national differences worthy to consider for the relationship between ill health and temporary employment. To begin with, EPL for the temporary employment is different in the three countries. EPL for temporary employment is considered here because of its influence on the second potential different factor - temporary employment prevalence. Subsequent sections in this chapter will examine labour market policies of the three countries.

### **4.1 Social Security - Labour Market Policies (LMPs)**

Labour Market Policies are implemented to ease the burden of people and relieve them of their total dependency on the labour market – what Esping-Anderson referred to as de-commodification (Esping-Andersen 1990). At the same time, these policies act as activation policies that propel the unemployed to look for employment. However, one and perhaps most relevant factor to examine is the eligibility requirement for these benefits. The temporary employed could be disadvantaged if these requirements do not favour them. For instance, if they do not meet the demanded previous work requirements before one qualifies for the benefits.

According to Esping-Andersen, a welfare state regime is characterized by the way risks are pooled, hence the Scandinavian welfare states share some central features in dealing with risks (1999 p. 33-7). All the three countries view risks as ‘social’ risks, thus, it is the responsibilities of the state to help reduce the effects of these risks on the citizenry, by expanding the categories of citizens with legitimate needs for income protection. Although these welfare states act in conformity with the market, distinct welfare policies have been implemented to minimize citizens’ over-reliance on the market, to de-commodify their welfare. (Esping-Andersen 1990).

The characteristic attribute of the Scandinavian welfare policy corresponds with Marshall’s idea of a welfare state (1950/1992). According to Marshall (1992), “good reasons for a welfare state are to moderate class divisions and protect the equal status of all citizens”. Policies such as unemployment benefits and sickness benefits are administered on a universal basis, thus guaranteeing social rights to everyone, and reducing inequalities in the labour market.

However, as noted by Kildal (2001), while the Scandinavian countries have taken responsibility for a wide range of risks through employment and passive labour market policies such as unemployment and sickness benefits, not all risks are captured. A certain category of people such as able-bodied needy citizens, who neither receive income from wealth or work nor fit into the national income-security system because of their meagre salaries even if they are working, are rescued through Social Assistance (Kildal 2001). These are highly selective acts, with high social control and assessments. Benefits from such assistance are often very little and could barely solve the basic needs of the recipients. People who receive these assistances are usually placed on active labour market policies (ALMPs) - workfare policies - that makes them work or engage in career-enhancing activities as a condition for receiving the benefits.

On the one hand, active labour market policies can help beneficiaries to gain the expertise and qualification to enable them to gain employment. Moreover, they could be motivated by learning from people in the same situation and through networking that help them meet informal recruitment channels – thus bridging the gap between them and prospective employers. On the other hand, participants could remain in the program and be taking the benefit instead of finding a job – known as a locked-in effect. Perhaps the most crucial negative impact of workfare policies is the possibility to reinforce stereotypes of beneficiaries leading to stigmatization. In addition, participants usually do not have the freedom of choice on the type of job to do. They may have accepted any job available to receive the assistance.

### **4.1.1 Danish Flexicurity Labour Market Model**

Flexicurity is a triangle comprising of flexibility, security, and active labour market policy. Private sector workers in Denmark can change jobs easily due to the flexibility in the rules for hiring and firing. These rules make it relatively easy for employers to dismiss employees during downturns and hire new employment when economic condition improves (Ministry of Foreign affairs, Denmark, 2017). The major aim of the flexicurity is “to promote employment security over job security”. The advantages of the model include employers’ flexibility with labour force and employees’ enjoyment of the safety net of a generous unemployment benefit system and an active employment policy (Ministry of Foreign Affairs 2017). The active employment policy offers education and guidance to the unemployed to increase their employability skills.

However, as revealed by Jason and Heyes (2011) countries that maintained strong employment protection laws (EPLs), experienced a relatively fewer labour market disruptions than countries with weaker EPL during the economic downturn (Heyes 2011). Moreover, there is a skill component in the Danish system that makes the rules more flexible for the employment of blue-collar (unskilled/manual) workers. The rules for executive and white-collar (skilled) workers are quite restrictive. These nuances in the Danish system may not be captured in the general OECD EPL for the temporary employment indicator. The indicator could be possibly lower for the unskilled labour force. Implying that temporary work contract and the associated adverse effects could be higher among the unskilled workers.

### **4.1.2 Unemployment and Sickness Policies**

The current study will devote much attention to two of the labour market policies that perhaps could have a major effect on temporary contract workers in Denmark, Norway, and Sweden. These include unemployment benefits and sickness benefits. Eligibility and amount received from these benefits depend to a large extent on previous employment or income. The temporary employed will either be disqualified or receive less benefit amount because of their relatively lower income. The similarities and the differences that exist in the eligibility requirements, the generosity of the policies and their possible effects on temporary employment in general and on those with ill health is discussed in the study.

Unemployment benefit is intended to partly compensate for the loss of income owing to the loss of a job. Table 1 reviews the main features of unemployment policies in the three countries. The

three countries run different unemployment policy systems (Scruggs, Detlef, and Kati 2017). The Danish system is a subsidized voluntary type. This means that unemployment benefits depend on one's contribution to an unemployment insurance. In Norway, one qualifies for unemployment benefits when he lives and work in Norway and is a member of the national insurance system. Sweden combines the systems in Denmark and Norway. There is a benefit for people for just being a worker and for being a member of the voluntary unemployment insurance.

I used the generosity measurement of Scruggs (2014). The measures in Norway (14.2—13.9) are much more generous compared to than Denmark (9.4 – 9.5) and Sweden (8.2 – 9.1). This is quite startling, given that generous unemployment benefit is one main argument for advocating for the advancement of the Danish flexicurity model in the labour market.

Norway is more generous when we consider other measures as well. The *qualification period* is shorter (4 vs. 52 weeks) in Norway than in Denmark and Sweden. The unemployment benefit *duration* is longer (104 vs. 60 weeks) in Denmark and Norway than in Sweden. Also, unemployment coverage – the unemployed who receive the benefit – is high in Norway (92%), followed by Denmark (71%) and lower in Sweden (68%).

Other important measures considered include conditionality requirements and sanctions. An indirect or passive way to enforce rules regarding unemployment benefits includes increasing conditionality, obligations and sanctions on the part of the unemployed (Knotz 2012). These conditionalities include *Job-search requirements*, *work-availability criteria*. These two requirements and *sanctions* are evaluated by the data from Hasselpflug (2005). Denmark (1) and Sweden (1) have lower scores than Norway (2). There are cross-national differences concerning the options to refuse employment opportunities, with Norway (5) and Denmark (4.25) being sterner than Sweden (3.25). The sanctions for the non-compliant to the obligations are stringent in Norway (2.33) and Sweden (2.33) than Denmark (2).

Looking closely at these policies, we can infer that certain category of temporary employees may be on the losing side on unemployment benefits because of certain eligibility requirements. One requirement which could be a disadvantage to temporary workers is previous work history – qualification period. That is the number of weeks one should have work before he or she qualifies for unemployment benefit. Temporary contract workers may be unable to meet the work history

requirement or earn little amount as unemployment benefit when they are laid off after their contract elapses.

Table 1. Summary of Unemployment Policies in Denmark, Norway, and Sweden

	<b>Denmark</b>	<b>Norway</b>	<b>Sweden</b>
Type of System <sup>a</sup>	Subsidized Voluntary insurance	Universal /social insurance	Universal/Subsidized voluntary insurance
Unemployment benefit Generosity (2010/2011) <sup>b</sup>	9.4 - 9.5	14.2 - 13.9	8.2 - 9.1
Qualification Period (Weeks) <sup>b</sup>	52	4	52
Unemployment Duration (Weeks) <sup>b</sup>	104	104	60
Waiting Period (days) <sup>b</sup>	0	3	7
Unemployment Coverage% <sup>b</sup>	71	92	68
Means Tests	No means test	No means test	No means test
Expenditure of GDP% <sup>c</sup>	2.28	0.489	0.566
<b>Conditions</b>			
Voluntary/Involuntary <sup>a</sup>	(In) Voluntary	(In) Voluntary	(In) Voluntary
Job Search Requirements (0 - 5) <sup>d</sup>	1	2	1
Workability Criteria (0-5) <sup>d</sup>	4.25	5	3.25
Eligibility Criteria <sup>e</sup>	1	0.04	0.22
Sanctions <sup>d</sup>	2	2.33	2.33

<sup>(a)</sup>Missoc 2016; <sup>(b)</sup>Scruggs, Jahn, and Kuitto, 2017; <sup>(c)</sup>OECD, 2016; <sup>(d)</sup>Hasselflug, 2005; <sup>(e)</sup>Knotz 2012

With generous unemployment benefits, shorter qualification period and higher coverage of the unemployed in Norway, temporary employment among people reporting LLSI may be lower in Norway than Denmark and Sweden. This is because the temporary employed in Norway are assured of a generous benefit that can mitigate their hardships when they lose their jobs. People with ill health in Norway are more likely to rely on unemployment benefits at least for the period that they are eligible whiles searching for permanent contract jobs instead of searching for another temporary contract work. Thus, temporary employment prevalence among people with ill health may be minimal in Norway, as compared to Denmark and Sweden.

Sickness benefit is an amount one receives for his/her inability to work due to illness. This benefit is offered in all three Nordic countries with similar conditions. Table 2 provides a summary of the *sickness policies* in Denmark, Norway, and Sweden. The three countries are quite similar to many sickness policy characteristics just like unemployment policies. However, there are

differences as well. Sickness benefits are more *generous* in Norway (15.9) but unlike unemployment benefits, sickness benefits are more generous in Sweden (14.9) than Denmark (12.3). *Duration* for sickness benefit is limitless in Sweden, but it is 52 weeks and 22 weeks in Norway and Denmark respectively.

Table 2. Summary of Sick Benefit Policies in Denmark, Norway, and Sweden

	<b>Denmark</b>	<b>Norway</b>	<b>Sweden</b>
Type of System <sup>a</sup>	Tax-financed protection scheme for employees and self-employed with earnings-related benefits	Compulsory social insurance scheme for employees and self-employed with earnings-related benefits	Compulsory sickness insurance for employees and self-employed with earnings-related benefits
Sickness Benefit Generosity (2011) <sup>b</sup>	12.3	15.9	14.9
Qualification Period <sup>b</sup>	13	4	0
Duration (in weeks) <sup>b</sup>	22	52	Not applicable
Waiting Days <sup>c</sup>	0	0	0
Sickness Benefit Coverage <sup>b</sup>	1	1	0.87
Means Test <sup>a</sup>	No	No	No
Expenditure on GDP% <sup>a</sup>	1.4	2.3	1.4
Taxation of sickness Benefits <sup>b</sup>	Yes	Yes	Yes

<sup>(a)</sup>Missoc 2018; <sup>(b)</sup> Scruggs, Jahn, and Kuitto, 2017; <sup>(c)</sup> Knotz 2012

Furthermore, there is no *qualification period* for beneficiaries in Sweden once the person is working, but there is a *qualification period* of 4 weeks and 13 weeks in Norway and Denmark respectively. Thus, a beneficiary must work for more weeks in Denmark before he or she meets the requirements for sickness benefits.

One key risk the temporary contract workers with poor health may take is to forfeit sick leave and sickness benefits (even if they qualify) and work in their poor health conditions because of the fear of losing their jobs or losing the chance of gaining a permanent contract. This could also lead to further deterioration in health which could lead to continuous stay in temporary employment and the use of more health services.

## 4.2 Employment Protection Legislation (EPL) for Temporary Contracts

The EPL for temporary employment shows the strictness of the temporary contract regulations (OECD, 2013). Data from version 3 of the OECD indicator for temporary employment was used for the EPL measurements. Version 3 measures the strictness of the regulation on the use of fixed-term and temporary work agency contracts. Unlike previous versions that had 6 data items, version 3 incorporates 8 data items measured on a scale of 0–6 where 6 indicates strict EPL for a temporary work contract.

Table 3. Items on version 3 of the OECD indicator for Temporary employment

FTC1	1985-2013	Valid cases for use of fixed-term contracts
FTC2	1985-2013	Maximum number of successive fixed-term contracts
FTC3	1985-2013	Maximum cumulated duration of successive fixed-term contracts
TWA1	1985-2013	Types of work for which temporary work agency (TWA) employment is legal
TWA2	1985-2013	Restrictions on the number of renewals of TWA assignments
TWA3	1985-2013	Maximum cumulated duration of TWA assignments
TWA4	2008-2013	TWA: authorisation or reporting obligations
TWA5	2008-2013	Equal treatment of regular and agency workers at the user firm

Source: OECD Stat 2018

A temporary work agency employs workers and hires them out to perform their work at a user company. The user company often supervises the work of the temporary agency worker. However, there is no employment relationship between the temporary agency worker and the user company (ILO 2017). The applicable employment contracts for the agency works are temporary in nature, with limited duration and no assurance of extension. The key characteristic of agency work is flexibility for both worker and employer which is in line with the labour market deregulation approach, blamed for increased temporary employment instead of serving as a stepping stone into permanent employment. Also, since the user company has no relationship with the agency employed worker, it is even much easier to release such workers to the agency and those with ill health are more likely to be affected most. That is if their health hampers their productive abilities.

In Denmark, fixed-term contracts are permissible for a definite period or for a specific task, there are no limits on the number of successive fixed-term contracts after the initial contract, and there are no limits on cumulated subsequent standard fixed-term contracts (OECD 2013). This implies that employers can give repeated fixed term contract without any pressure to give permanent employment contract. On temporary work agencies, the Danish system puts no restrictions on the number of contract renewals, and no limit on temporary work agency if there are employment breaks between subsequent assignments. Also, there are no reporting requirements by a temporary work agency to the labour authority after company registration. However, there are equal treatment for fixed term contract and permanent contract workers with regards to pay and working conditions (OECD, 2013).

In Norway, a temporary employment contract is offered for work which is of a temporary nature or work as a temporary replacement for another person or persons. Other areas where temporary employment is permissible is work as a trainee, participants in the labour market, athletes, trainers, referees, and other leaders within organised sports or for a maximum period of twelve months (Working Environment Act, 2017). In the case of successive contracts, justification of contract is subject to court examination – this is more regulated than in Denmark where there is no limit to successive contracts.

Employees who have been temporarily employed for more than four consecutive years on work of temporary nature or three years as a temporary replacement for another person or persons shall be deemed as permanently employed in Norway. On temporary work agencies, conditions for using Temporary agency workers is the same as fixed term contract in Norway, the setup of temporary agency requires periodic reporting obligations, and equal treatment is expected for regular workers and temporary agency workers (OECD, 2013). Temporary employment is thus, more restricted in Norway than in Denmark based on the OECD scores and assessments. However, recent changes in employment legislation which allows the use of temporary workers to a maximum of 15% of the workforce in an organization is a move towards more flexibility on the part of employers.

In Sweden, fixed-term contracts are offered for temporary replacement of absent employees, seasonal work, personnel above 67 years of age, and probationary employment contract (maximum six months) (OECD, 2013). Though there is no limit to the maximum number of successive standard fixed-term contracts, an employee with a general fixed term contract for in



aggregate more than two years, or as a substitute for in aggregate more than two years in the last five years, is eligible for permanent employment.

Table 4. The OECD indicators on Employment Protection Legislation

		Protection of permanent workers against individual and collective dismissals	Protection of permanent workers against (individual) dismissal	Specific requirements for collective	<b>Regulation on temporary forms of employment</b>
Denmark	2013	2.32	2.10	2.88	<b>1.79</b>
Norway	2013	2.31	2.23	2.50	<b>3.42</b>
Sweden	2013	2.52	2.52	2.50	<b>1.17</b>

Scale from 0 (least restrictions) to 6 (most restrictions), last year available

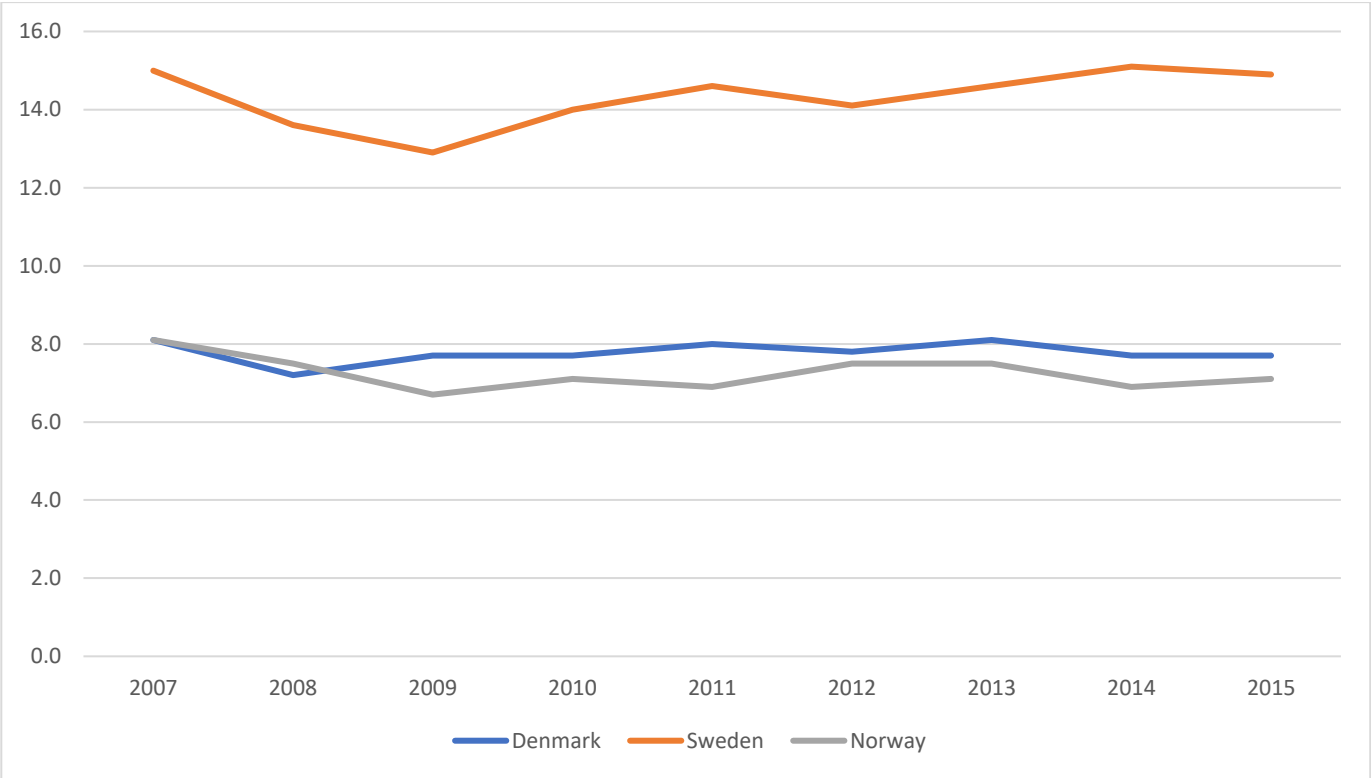
Like Denmark, Temporary agency employment is generally allowed in all sectors of the labour market in Sweden. There are no restrictions on the number of renewals and/or prolongations of temporary agency work assignments but there are restrictions for stipulated collective agreements. There are no limits on temporary work agency assignments and no specific rules for temporary work agency contracts, they are open-ended. Temporary work agency authorization is voluntary. Unlike Denmark and Norway, exceptions from the principle of equal treatment can be made on salaries for fixed-term contracts employees and temporary agency workers through collective agreements (OECD, 2013). This exception could lead to disparity between the income of the temporary employed and permanent employees. Since employers are profit-oriented, any chance to cut cost is likely to be exploited. The salaries of temporary workers with less bargaining power could be affected adversely.

The above differences and the figures from Table 4 shows a lower EPL of temporary employment differences in Sweden (1.17), followed by Denmark (1.79), and Norway (3.42). Temporary employment is more protected in Norway. If the policies on labour market deregulation are anything to go by, then we can predict higher temporary employment rates in Sweden and Denmark which may result in a higher prevalence of temporary work contract for people with poor health.

### 4.3 The rate of Temporary Employment

The rate of temporary employment as of 2015 is 7.7%, 7.1% and 14.9% for Denmark, Norway, and Sweden respectively – figure 1. The Organization of Economic Cooperation and Development (OECD 2017) defines temporary employment to include wage and salary workers whose job termination dates are pre-determined. This definition of temporary employment which tends to encompass seasonal, contract, casual, and fixed-term employment is adopted for this study because of the data used for the analyses. The data from the European Social Survey (ESS) categorized employment based on contract type – Unlimited contract, Limited contract, and No contract. Temporary employment in this study refers to a limited contract which will be compared to an unlimited contract (permanent employment) in the analysis.

Figure 1. Temporary employment rates by total employment from 2007 – 2015 in Denmark, Norway, and Sweden (age: 20 – 64 years). Source: Eurostat (2017)



Based on the differences in the temporary employment rate in the three countries, and the difference in EPL for temporary employment in section 2.3, I predicted that health-related temporary employment prevalence will be higher in Sweden. Employers have more flexibility to hire on a temporary basis which in turn enables them to hire and put workers, including those with poor health on probation to access their suitability for permanent employment.

## **5 . DATA AND METHODOLOGY**

The current study used quantitative data – specifically survey data for the analysis. Research using the quantitative methodology usually deals with secondary data in a systematic way to investigate phenomena and their relationships or statistical associations. Results from quantitative research are normally generalizable because of the relatively large sample size as compare to qualitative research. Generalizability can take two forms; the results can either be generalizable to the entire population or holds more explanatory power for certain subgroups compared to others. The current study is more generalizable to people who are already in the labour market and are either employed on a permanent or temporary basis. People outside the labour market are the target of the current study.

Secondary data analysis examines existing data for another research purposes. A fruitful source of secondary data is large national survey data sets, available publicly, and with varied reasons for collection. Because of the varied and cross-national features, national survey datasets are suitable for studies investigating policies across geographical space. As noted by Johnston (2017), existing data is becoming more prevalent as it provides a viable option for researchers who have limited time and resources. That aside, secondary data analysis is an empirical exercise that applies the same basic principles as any other research. Secondary data analysis is, therefore, a viable method to utilize in the process of inquiry when a systematic process is followed (Johnston 2017).

The main disadvantage of the utilization of secondary data is the lack of control of the data collected since almost all the variables are predetermined. However, this could be curbed with proper evaluation of the dataset to ensure the appropriateness of the data for the research topic and the stated research questions. Moreover, cross-national survey data sets are very useful in situations where the researcher must compare two concepts that run across different policy settings.

This chapter outlines the study design, data (data suitability and possible limitations), the definition of variables, the empirical model and a step by step outline of the process of data analyses.

## 5.1 Data and Limitations

Data from the European Social Survey (ESS) was used for the analysis. The ESS is an academically driven cross-national survey that has been conducted biannually across Europe since its establishment in 2001 (ESS 2017). The “key aim of the ESS is to implement high-quality standards in methodology and to improve standards in the field of cross-national surveys” (ESS 2017). It is worthy to note that register data provides a very objective health indicator and are ideal for measuring health changes. But since the study focused on cross-national comparisons of health and labour, there is basically only one option: larger comparative surveys. It is difficult to get hold of health and labour market information in existing registers – doing so in three different countries is even more difficult.

Round 7 of ESS data (ESS7-2014) was used for the analysis due to its suitability to the objectives of this study as it includes more health information than other rounds of ESS data. The data was suitable because it had information on specific health conditions and general subjective health conditions. Health conditions such as back and neck pain, severe headache, muscular and joint pain in the foot or leg, muscular and joint pain in the arm or hand, allergies, and digestion and stomach related conditions were captured in this ESS data. Also, temporary employment (limited contract jobs) and permanent employment (unlimited contract jobs) were also spelt out distinctively. Finally, socio-demographic variables of interest such as age, gender, and education were also measured in the ESS7-2014 dataset. These variables were measured in all the three countries considered in the study (i.e. Denmark, Norway, and Sweden)

However, as already noted, a major disadvantage of the utilization of secondary data is the lack of control of the data collected since almost all the variables are predetermined. For instance, the ESS7-2014 did not include different categories of temporary employment such as on-call jobs, seasonal jobs, and fixed contract jobs. It would have been ideal to evaluate the relationship between these employment types and health. ESS7-2014 measured a limited contract which is very all-encompassing. Nonetheless, findings using this variable is in line with the main objective of the study and will set the tone for further studies into the different forms of limited contracts. There was no ambiguity on unlimited contract as defined in the data, as representing permanent employment. Overall, the data was well suited for the current study.

### **5.1.1 Data Quality**

As acknowledged by ESS, measuring attitudes cross-nationally has challenges that go beyond those of surveys conducted in a single country or language. In this regard, all countries are required to adhere to the methods outlined in the survey specifications to ensure data quality. In addition, the ESS Core Scientific Team (CST) carries out a range of data quality related activities throughout the survey lifecycle and across ESS rounds (ESS 2017). Including evaluating the quality and comparability of measurement instruments, assessing socio-demographic sample composition, and assessing the process and output quality of the survey data.

Moreover, steps are taken to enhance the response rate and minimize nonresponse bias. The ESS minimum response rate is 70% and respondents are selected to represent all subgroups such as age, gender, and education to avoid unbalance response rate in the survey data (ESS 2017). Unequal representations noticeable in subgroups are adjusted for using post-stratification ESS weights to ensure survey data is representative of the national population of the selected age range – 15 years and above for ESS. This is essential as quality survey data enables researchers to generalized findings.

### **5.1.2 Study Sample**

The study sample included respondents with ages 20 to 64 years. This age range was selected because of two main reasons; (1) the lower age bound was due to education while the upper age was due to the labour force participation in the three countries with a retirement age of 65 years in Sweden and Denmark, and 67 years in Norway (OECD 2017a) (2) to enhance comparison with the temporary employment rates from the Eurostat 2016 data (figure 1). The number of respondents was 911, 885, and 1034 for Denmark, Norway, and Sweden respectively representing the total number of people who were employed in the ESS dataset. Table 5 represents the total employed respondents which are sub-divided into gender, age, education.

Table 5. Study Sample size.

Employment by Sociodemographic variables	Country		
	Denmark	Norway	Sweden
Male	437 (47.60)	457 (51.63)	488 (47.18)
Female	474 (52.40)	428 (48.37)	546 (52.82)
Primary Education	123 (13.54)	72 (8.15)	67 (6.51)
Secondary Education	437 (44.88)	438 (49.60)	633 (61.51)
Higher Education	378 (41.58)	373 (42.25)	329 (31.98)
Age group1 (20 – 34)	257 (28.21)	264 (29.83)	335 (32.40)
Age group2 (35– 44)	203 (22.28)	218 (24.63)	222 (21.47)
Age group3 (45 – 64)	451 (49.51)	403 (45.54)	477 (46.13)
<b>TOTAL EMPLOYED</b>	<b>911</b>	<b>885</b>	<b>1034</b>

\*\*\*Percentages in brackets.

### 5.1.3 Dependent Variables

The main dependent variable is temporary employment, which was labelled as people with a limited work contract in the ESS data. Temporary employment thus covers all jobs contracts with a predetermined end date. Limited contract prevalence was compared to unlimited contracts – permanent work contract. People with temporary contract jobs are less secured and look more precarious than those with permanent contracts.

The prevalence of temporary work contract among people with good health will be compared to those with bad health. The aim is to ascertain the differences in temporary and permanent work contract prevalence among people with good health and those with bad health. More specifically, temporary work contract among people who reported specific health conditions (i.e. back and neck pain, severe headache, muscular and joint pain in the foot or leg, muscular and joint pain in the arm or hand, allergies, and digestion and stomach related conditions) will compared to those who reported none of these health conditions.

Good health as used above encompasses people who reported no LLSI and those who reported good subjective general health. Bad health also includes those who reported LLSI and bad/fair subjective health. These are clarified more distinctly in 5.4.2.

## **5.2 Study Design**

This study is a cross-sectional study based on round seven survey data of the ESS – ESS7-2014. A cross-sectional study collects information from data drawn from a population sample at one point in time. Cross-sectional studies are suitable for estimating the prevalence of temporary employment among people with ill health – the main aim of the current study. The design captures differences in the temporary employment among people with ill health and those with good health. I will analyze the main variables that describe the statistical association between temporary employment and health across the three Scandinavian countries.

I used each of the employment contract types as a dependent variable in a direct entry multivariate Ordinary Least Square (OLS) regression along with the independent variable and other covariates explaining the potential influencing factors. Covariates considered in the study include age, gender, and level of education.

I will go a step further to include and examine the prevalence of temporary employment, and permanent employment among people with six (see section 5.4.2 for more on these conditions) specific health conditions. The analysis will be carried out alongside specific subjective health conditions. The interplay of covariates such as age, gender and education were also estimated to ascertain their impact on temporary among people with good health and ill health. All the variables were sorted and analyzed in each country separately.

## **5.3 Empirical Model**

Correlation and the effects of the independent variables on the dependent variables are best examined and analyzed by the use of multivariate regression analyses (Newbold, Carlson, and Thorne 2010, p.504-509). Dependent variables are examined by the inclusion of independent variables. Multivariate OLS regression examines the effect of an independent X-variable on a dependent Y while controlling for the effects of the other covariates or controls.

The general empirical linear equation model for multivariate regression is characterized by the following:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \dots + \beta_nX_n + \varepsilon_i$$

Y denotes the dependent variable that is being predicted.  $B_0$  is the constant representing the regression intercept and is equal to Y when X is zero. The Betas ( $\beta_x$ ) represent the coefficients for their corresponding explanatory variables ( $X_x$ ). The Beta coefficients measure the influence of the changes in the independent variables (X) have on the expected value of the dependent variable (Y) when all other covariates are controlled for as constants.  $\varepsilon_i$  represents the residuals or difference between the predicted and the observed value for Y.

## 5.4 Variables

The prevalence of temporary employment can be influenced and affected by, but not limited to the following: health conditions of the employee, sociodemographic variables such as age, gender, and educational status, and the interplay between sociodemographic variables and health.

### 5.4.1 Independent Variables

The independent variables used in the analyses accounted for the potential factors that could influence the dependent variable. The independent variable was health, measured as people reporting LLSI and subjective general health. LLSI should capture respondents with quite serious health conditions that are noticeable by employers, which employers fear could affect productivity. Subjective bad/fair health conditions, on the other hand, comprise a more heterogeneous health population. It is, therefore, more likely that people reporting LLSI will yield stronger effects - people with LLSI are more likely to hold more temporary work contracts.

#### *Limiting long-standing illness (LLSI).*

The variable was dichotomized and categorized persons into either the group with LLSI or the group with No LLSI. The wording of the question to determine this variable was as follows:

*Are you hampered in your daily activities in any way by any illness, or disability, infirmity, or mental health problem?* Answers “yes a lot” and “yes to some extent” were coded as 1 and no



coded as 0. This question lay less emphasis on the long-standing aspect of LLSI (this is discussed further in the limitations section 7.3).

### ***Subjective General health (self-rated health)***

Good health was coded into two dummy variables based on the question “*how is your health in general?*” Answers “very good”, “good” were coded as 1 and “very bad”, “bad”, and “fair” coded as 0 respectively. Those with fair health are included for two reasons. Firstly, because the number of observations for very bad or bad health in the ESS dataset was very low (4.75%, 6.04%, and 3.31% in Denmark, Norway, and Sweden, respectively), yielding problems with statistical power. Secondly, even people with less serious health impairments could face difficulties in moving from a temporary work contract to permanent employment.

### ***Specific Health Conditions***

On specific health conditions, the survey question was posed this way: “*which of the health problems that you had or experienced in the last 12 months hampered you in your daily activities in any way?*” This question was considered as people who respond to this question have problems that could influence their productivity negatively. The variable was coded into a series of dummy variables. Respondents who marked the cards representing specific health conditions were coded as 1 and the unmarked cards were coded as 0.

Twelve (12) class of disease conditions were considered in the ESS survey data (see more details in the footnote below)<sup>1</sup>. Six of the twelve conditions were included in the statistical analyses. These conditions include back and neck pain, severe headache, muscular and joint pain in the foot or leg, muscular and joint pain in the arm or hand, allergies, and digestion and stomach related conditions. The six health conditions were selected because of a fairly large number of observations (discussed further in section 5.5 and Table 10). Also, aside from allergies, the other five health conditions could probably be observed directly by employers, which could influence their hiring decision. The other six health conditions had very low observations and could yield problems with statistical power (see Appendix I for details on these health conditions).

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<sup>1</sup>The health conditions in the ESS data are <sup>1</sup>allergies, <sup>2</sup>breathing problems, <sup>3</sup>back and neck pain, <sup>4</sup>cancer, <sup>5</sup>diabetes, <sup>6</sup>heart and circulatory problems, <sup>7</sup>high blood pressure, <sup>8</sup>pain in the muscular or joint pain in the hand or arm, <sup>9</sup>pain in the muscular or joint pain in the foot or leg, <sup>10</sup>severe headache, <sup>11</sup>skin conditions, and <sup>12</sup>stomach and digestion related conditions.

## 5.4.2 Covariates

### *Age*

Age is derived from the variable *agea* representing the age of respondents. The categories were grouped using the European standard population as follows: 20 – 34 years, 35 – 44 years, and 45 – 64 years. This acted to analyze if there are any differences in a temporary contract among people with bad health and those with good health in the interplay with age of employees. In the regression found in chapter six, the variable age was collapsed into three groups - age 20 – 34 years, 35 – 44 years, and 45 – 64 years, and named age group1, age group2 and age group3 respectively. Age group 3 (45 – 64 years) was used as the reference group.

I expect the temporary work contract prevalence among people with good and ill health to be higher for those in the age group1 (younger age group) because of their relatively lesser attachment to the labour market – as assumed earlier in the study. On age group2 and age group3, the prevalence could be similar since most employees at these ages are quite firmly attached to the labour market. The differences might be seen on a country level due to the difference in EPL for temporary employment and the rate of temporary employment.

### *Gender*

Gender was included in the descriptive analysis and in the regression model to analyze if there are any differences in temporary work contract prevalence among people with ill health in relation to gender. This variable was coded as a dummy variable of 0 for males and 1 for females. Males were used as the reference category.

### *Education*

The educational level is based on the International Standard Classification of Education (ISCED) and it consisted of three dummy variables. In the analyses, less than lower secondary and secondary education is collapsed to primary education, lower tier upper secondary and upper tier upper secondary and vocational education is collapsed to secondary education. Lower tertiary and higher tertiary are also collapsed to higher education. Higher education was used as the reference category.

## 5.5 Analyses

Descriptive statistics were broadly used to describe the datasets and give an overarching picture of the interplay of health and sociodemographic variables such as age, gender, and education and

temporary work contract by tabulation and cross-tabulation of the variables of interest in STATA. I started the analyses by first organizing ESS7-2014 data to suit my topic and research questions. I recoded the variable *cntry* (countries in the survey data) and dropped other countries leaving only the three countries of interest. I also recoded and dropped all the ages that were not included in the analyses, leaving only the age group from 20 years to 64 years.

I then moved on to analyze the data and tried to get an overview of temporary work contract prevalence among people with ill health and good health. This was followed by cross-tabulation analyses to estimate the interplay effect of the sociodemographic variables (gender, age, and education) and LLSI on temporary work contract prevalence. Similar analyses were carried out but with the sociodemographic variable and general subjective health to ascertain their interactive relations on the permanent and temporary work contract.

Moreover, I carried out descriptive analyses to estimate the prevalence of temporary employment among people reporting LLSI or No LLSI as compared to good health and bad/fair health (general subjective health). I expect temporary contract prevalence to be higher among people reporting LLSI as it hampers the daily activities of employees – as postulated earlier.

The multivariate OLS regression analyses were finally performed to establish if there is any statistical association between ill health and temporary work contract prevalence. I started by running the regression analyses to examine the significant influence that LLSI has on temporary work contract prevalence in general. This was followed by similar analyses using general subjective health.

Finally, I analyzed back and neck pain, severe headache, muscular and joint pain in the foot or leg, muscular and joint pain in the arm or hand, allergies, and digestion and stomach related conditions to test the prediction outlined in section 3.1 and as already reiterated in this section. I assumed that there may be more statistical associations between temporary work contract and people who reported specific health conditions that hampered their daily activities. Thus, employers with the aim of maximizing profit through increased productivity are likely to select or keep people with these health conditions in temporary employment for further assessment. If the contrary is the case and temporary work contract prevalence is significantly higher among people who reported LLSI in general, then employers might have discriminated against people with ill health during the selection process.

Descriptive functions and the multivariate regression were performed using STATA statistical data analyses version 15.1. Microsoft Excel (2016) was used to re-arrange the data and for the construction of the descriptive figures and tables.

## 6 . RESULTS

### 6.1 Descriptive Statistics

Table 6. Distribution of permanent and temporary work contract based in Denmark, Norway, and Sweden

<b>COUNTRY</b>	<b>PERMANENT</b>	<b>TEMPORARY</b>	<b>% Permanent Employment</b>	<b>% Temporary employment</b>
Denmark	793	118	87.05	12.95
Norway	778	107	87.90	12.10
Sweden	869	163	84.20	15.80

Descriptive statistics for the variables included in the analysis are presented in Tables 6 – 10 and Figures 2 – 7. Table 6 displayed employment distribution among people with permanent and temporary work contract. As expected temporary work contract prevalence was higher in Sweden (15.80%) which is slightly higher than the temporary work contract rate in the Eurostat data in Figure 1 (14.49%). Temporary work contract prevalence in Denmark (12.95%) is higher than in Norway (12.10%) reflecting the differences in Figure 1 but with a 5.25% and 5% difference in Denmark and Norway respectively. Temporary work contract recorded in the data is higher than the figures from Eurostat for all the three countries in the study. The difference may be as a result of non-response, and dissimilarities among respondents who choose to respond to a survey question and those who chose not to respond, thus creating bias. This could affect the reliability and generalizability of the results in the current as the non-response can affect the statistical power in the results.

Nonetheless, the hypothesis that temporary work contracts might be higher in Sweden is still testable because of the high temporary work contract in Sweden. The feasibility of testing other predictions were observed in the descriptive statistic tables in subsequent sections.

Table 7. Prevalence of permanent and temporary work contract on the bases of NO LLSI and LLSI in Denmark, Norway, and Sweden.

Country	Contract type	NO LLSI	LLSI	% NO LLSI	% LLSI
<b>Denmark</b>	Permanent	592	201	<b>87.32</b>	<b>86.26</b>
	Temporary	86	32	<b>12.68</b>	<b>13.74</b>
<b>Norway</b>	Permanent	615	163	<b>88.88</b>	<b>84.46</b>
	Temporary	77	30	<b>11.12</b>	<b>15.54</b>
<b>Sweden</b>	Permanent	650	219	<b>85.98</b>	<b>79.35</b>
	Temporary	106	57	<b>14.02</b>	<b>20.65</b>

Table 7 depicts the distribution of permanent and temporary work contract among people with LLSI and those without LLSI in the three countries. As expected, temporary work contract prevalence was higher among people who reported LLSI in Sweden (14.02 vs 20.65) compare to those without LLSI. Likewise, temporary work contract prevalence was high in Norway among people who reported LLSI (15.54) as against (11.12) for people with no LLSI though lower than that of Sweden. In Denmark, the prevalence was similar for both LLSI and no LLSI employees (12.68 vs 13.74).

Thus, high temporary work contract prevalence in Sweden in Table 6 corresponds with a higher temporary work contract among people with LLSI in Table 7. Contrary, temporary work contracts among people who reported LLSI is higher in Norway than Denmark though general temporary work contract prevalence is quite similar in Table 6. However, since the focus is on temporary work contracts, the higher prevalence in Sweden and Norway quite indicates a higher temporary work contract association among people with LLSI in these countries, more so in Sweden.

Table 8. Prevalence of permanent, temporary work contract among people with GOOD HEALTH and ILL HEALTH in Denmark, Norway, and Sweden (Subjective General Health)

COUNTRY	CONTRACT TYPE	Good health	Bad/fair	% Good Health	% Bad/fair
<b>Denmark</b>	Permanent	615	178	<b>87.48</b>	<b>85.58</b>
	Temporary	88	30	<b>12.52</b>	<b>14.42</b>
<b>Norway</b>	Permanent	634	144	<b>88.05</b>	<b>87.27</b>
	Temporary	86	21	<b>11.95</b>	<b>12.73</b>
<b>Sweden</b>	Permanent	717	151	<b>87.12</b>	<b>83.43</b>
	Temporary	106	30	<b>12.88</b>	<b>16.57</b>

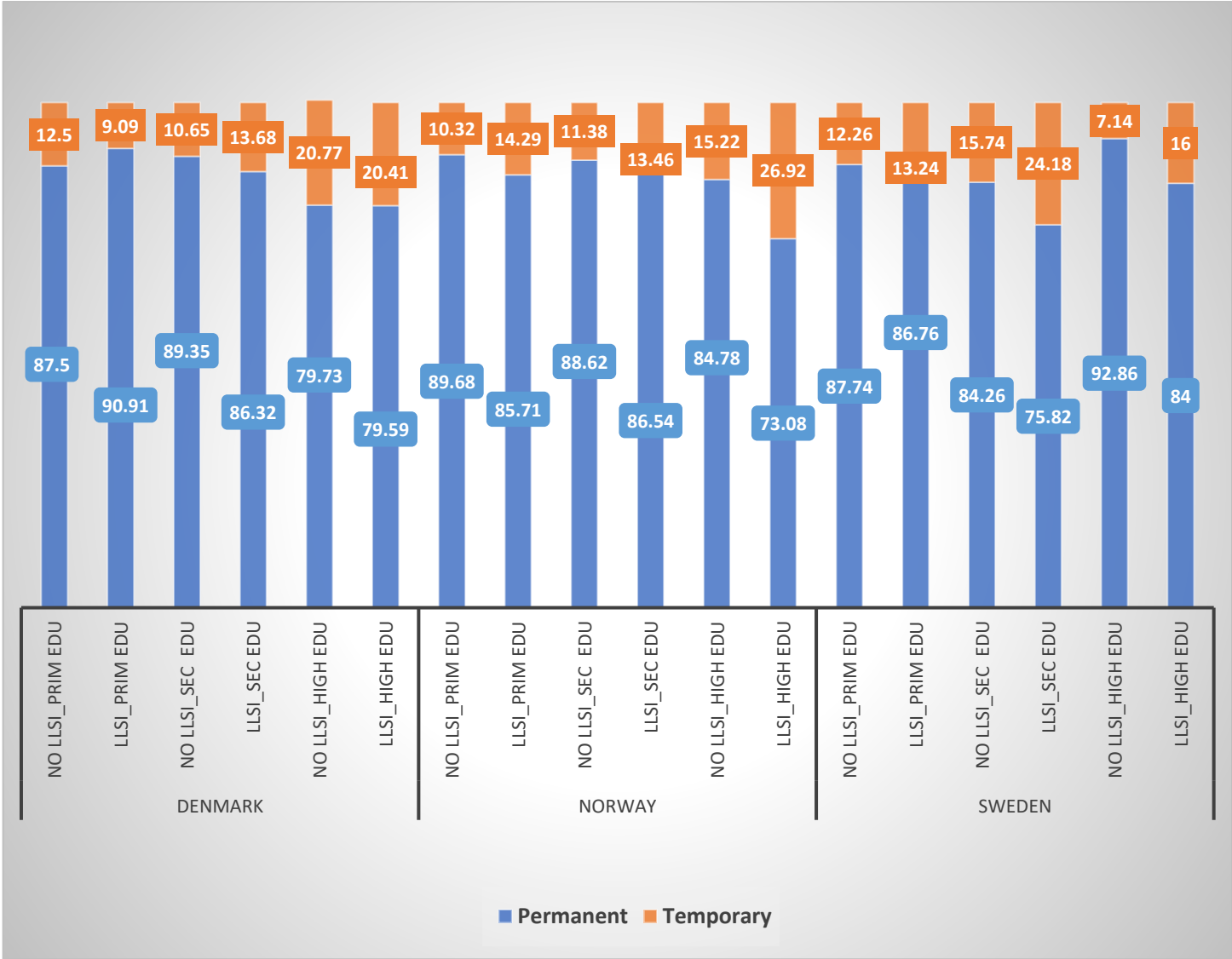
Compared to Table 7 temporary work contract prevalence is low in both Norway (12.73 vs 15.54) and Sweden (16.57 vs 20.73) for people reporting bad/fair health than those reporting LLSI in Table 8. Contrary to Norway and Sweden, the prevalence of temporary work contract is quite similar among people who reported bad/fair on the self-rated health measure and those reporting LLSI in Denmark (13.74 vs 12.73). This implies that those whose daily activities are hampered by ill health have a higher chance of landing on temporary contracts than those whose ill health generally do not hamper their daily activities in Sweden and Norway. The case is however different in Denmark where there are slightly more health inequalities for subjective bad/fair health than LLSI (14.42 vs 13.74) among the temporary employed.

The figures for those reporting no LLSI and good health is quite similar in Denmark (12.68 vs 12.52) and Norway (11.12 vs 11.95) and slightly different in Sweden (14.02 vs 12.88). This affirms that in terms of good health indicators employees are exposed equally to temporary work contract but slightly more exposed in Sweden.

## 6.2 The interaction between Health, the covariates and employment

The data shows varied differences among gender, age groups and level of education. The relative percentages for the variables relating to respective countries based on LLSI and self-rated health can be seen in Figures 2 – 10. The variables are displayed side-by-side so that the differences in percentages can be seen more clearly.

Figure 2. Permanent and temporary work contract prevalence (in percentages) based on education and LLSI in Denmark, Norway and Sweden



From Figure 2, it is evident that in Denmark, temporary work contract is highly represented equally by employees with a primary education, both for people who reported LLSI (20.41) and



those who reported No LLSI (20.27). In Norway, temporary work contract prevalence is higher among people with LLSI and lower education (26.92) the highest in all three countries. The prevalence for people with primary education who reported no LLSI is lower in Norway (15.22) than Denmark (20.27). However, Sweden has the lowest temporary work contract prevalence for both people with LLSI (16.00) and primary education and no LLSI and primary education (7.14).

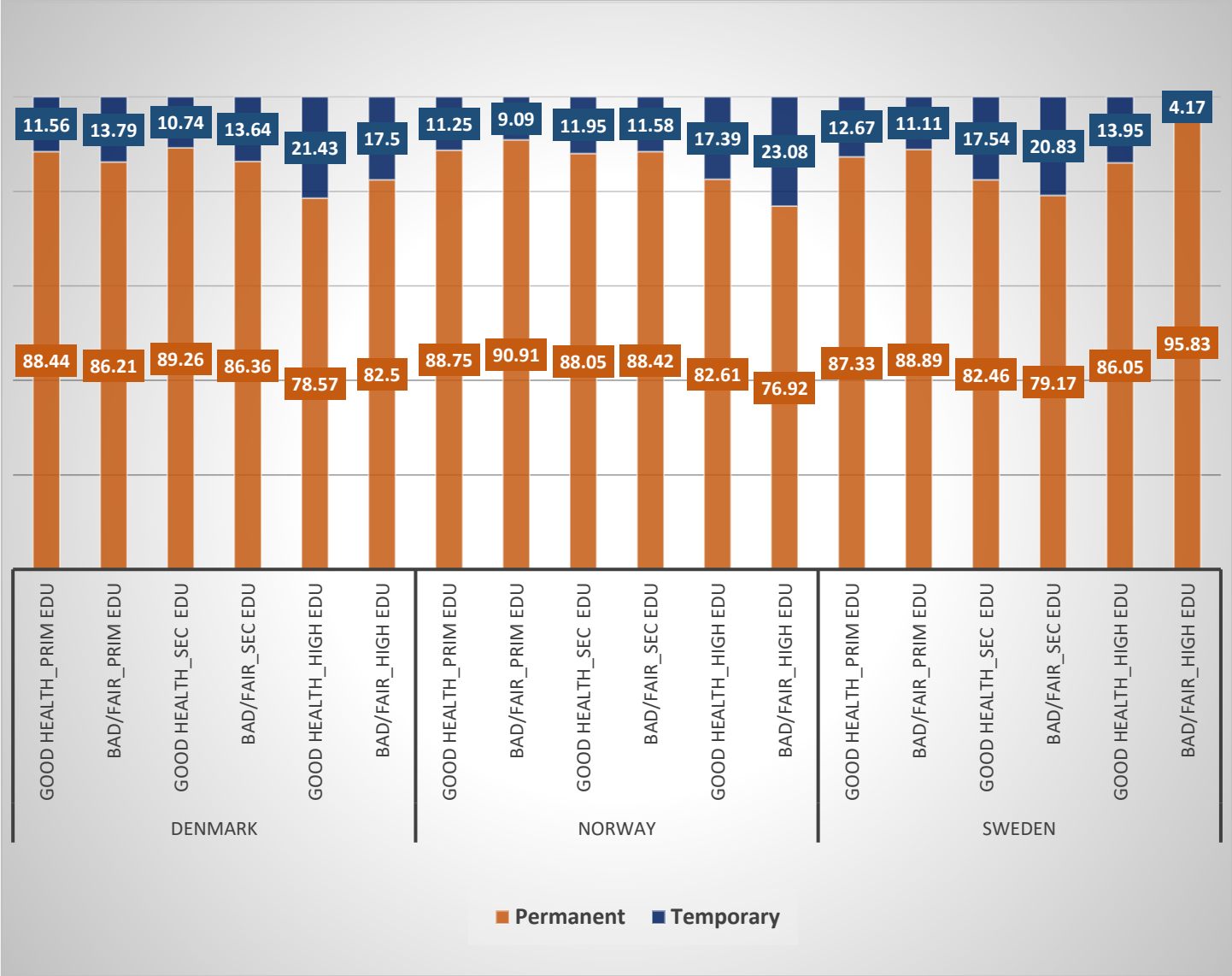
On secondary education and LLSI, temporary work contract prevalence is quite similar in Denmark and Norway (13.68 vs 13.46). The temporary work contract prevalence observed among people with secondary education and no LLSI in Denmark and Norway is also quite similar (10.65 vs 11.38). On the other hand, temporary work contract prevalence is high among people with secondary education and both LLSI (24.18) and no LLSI (15.74) in Sweden when compared to Denmark and Norway, and more so among people with LLSI and secondary education (24.18).

People with higher education and reported LLSI (20.41) are likely to hold similar temporary work contracts like those with higher education and reported no LLSI (20.77) in Denmark. The trends for higher education and reported LLSI and no LLSI are quite similar in Norway and Sweden too, with people with higher education and reported LLSI slightly higher. It is evident from the Figure that temporary work contract prevalence among people with secondary and higher education is also quite similar in Sweden and Denmark for both those who reported LLSI and no LLSI. Thus, the likelihood of holding a temporary contract might decrease with higher education in Norway and Denmark for people who reported LLSI and no LLSI. That for Sweden is different. People with primary education are likely to hold more permanent work contract than those with secondary education on both reported LLSI and no LLSI. However, the trends for higher education in Sweden is quite similar to those of Denmark and Norway. Thus, people with higher education with reported LLSI or no LLSI are more likely to hold temporary contracts in all three countries.

From Figure 3, we see high temporary work contract prevalence for people with primary education and bad/fair health than those with good primary education and good health only in Norway (23.08 vs 17.39). This trends in Norway is similar to the percentages in Figure 2. Thus, in Norway, temporary work contracts are more prevalent among people with primary education and who reported either LLSI or bad/fair health. In Denmark and Sweden, temporary work contracts were more among people with primary education and good health than those with

primary education and bad/fair health. The percentages were 21.43 vs 17.50 and 13.95 vs 4.17 for Denmark and Sweden respectively.

Figure 3. Permanent and temporary work contract prevalence in Denmark, Norway and Sweden based on education and subjective general health.



The trends in Denmark and Sweden in Figure 3, are different from those observed in Figure 2, where temporary work contract prevalence was almost the same for both primary education with LLSI and without LLSI in Denmark, and higher for primary education with LLSI than primary education without LLSI in Sweden. This implies that people with primary education who reported that their health conditions hampered their daily activities were more likely to land on a temporary work contract in Denmark and Sweden than those who reported general bad/fair health.

In summary, the interaction of health and education portrays less prevalence of temporary work contract among people with LLSI and primary education, and bad/fair health and primary education in Sweden, which is a direct opposite in Denmark and Norway. On the other hand, high temporary work contract prevalence in the interplay of secondary education and health is peculiar to only Sweden.

Figure 4. Permanent and temporary work contract prevalence in Denmark, Norway and Sweden – Gender x LLSI.



Figure 4 described the prevalence of permanent and temporary work contract in Denmark, Norway, and Sweden based on the interaction between LLSI and gender. Figure 4 showed similarities in temporary work contract for both males and females with LLSI (13.40 vs 13.97) and no LLSI (13.24 vs 12.13) in Denmark. Temporary contract prevalence is quite high among females with LLSI (18.35) than females with No LLSI (11.29) in Norway. Thus, females with ill health are more likely to hold temporary work in Norway. For males, the prevalence is quite similar among those with LLSI (11.90) and those without LLSI (10.99).

In Sweden, temporary work contract percentages are higher among males with LLSI (25.23) than females with LLSI (17.58) but quite similar among males and females without LLSI (13.30 vs 14.74). This implies that males with ill health are more likely to hold temporary work in Sweden.

Figure 5. Permanent and temporary work contract prevalence in Denmark, Norway and Sweden by Gender X Subjective Health.

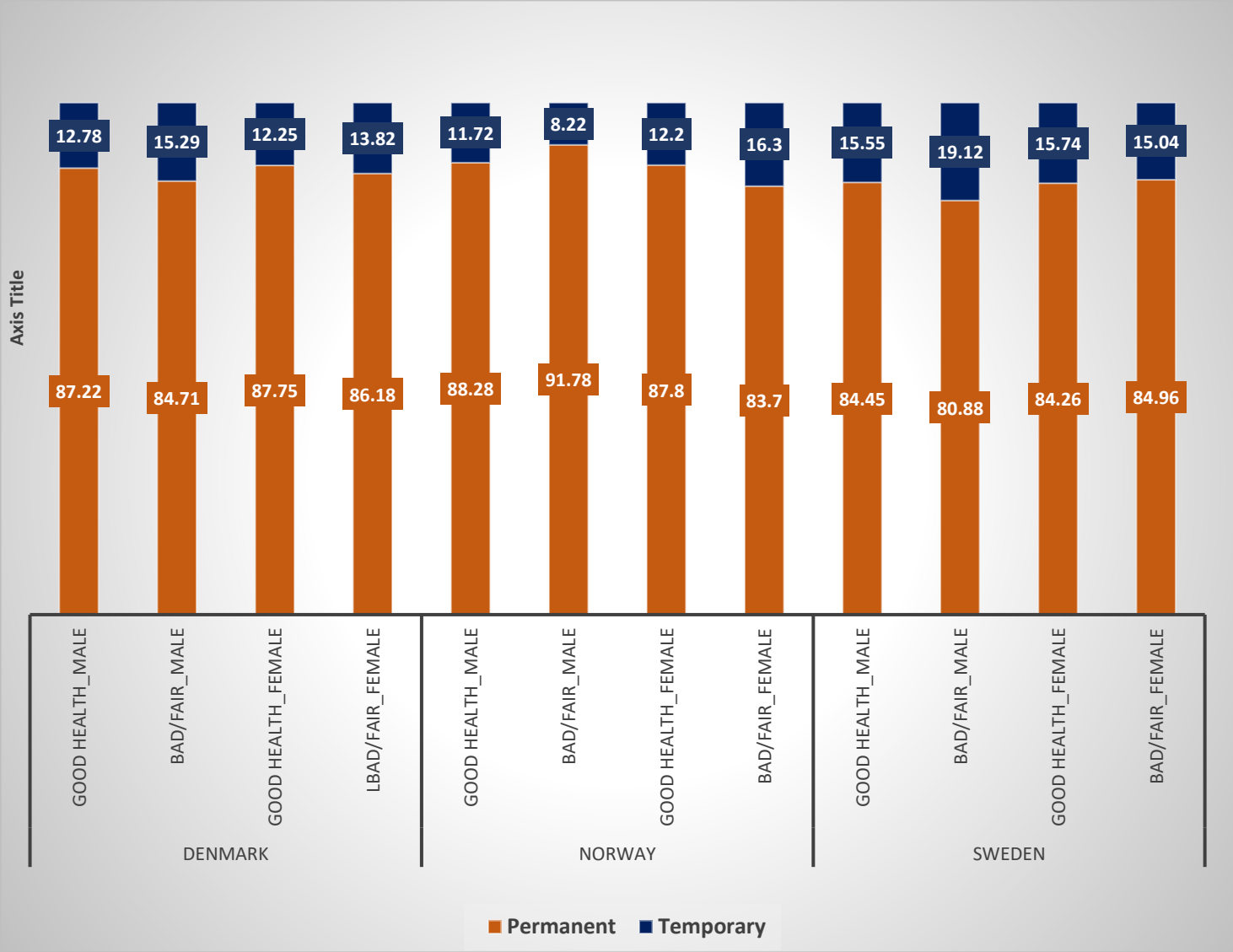


Figure 5 displays the percentages observed in the three countries based on the interplay of subjective health. The trend for females with good health (13.82) or bad/fair health (12.25) is quite similar and almost the same as females with LLSI in Denmark. That of males with bad/fair health (15.29) is slightly higher than males with good health (12.78) and also higher than males with LLSI (13.40) as observed in Figure 4. Thus, males who reported subjective bad/fair health are likely to hold temporary work than those who daily activities were actually hampered by their health conditions – LLSI in Denmark.

In Norway, temporary work contract prevalence is rather lower in both males (8.22) and females who reported bad/fair health (16.30) than those with LLSI (11.29 vs 18.35). However, the females with bad/fair health were still highly represented with temporary work than males. Thus,

unlike Denmark, females whose daily activities were hampered by bad health - LLSI (18.35) have quite a high temporary work contract prevalence than females with bad/fair health.

In Sweden, males with bad/fair health (19.1) have higher temporary work contract prevalence just that males with LLSI (25.23) in Figure 4. However, the prevalence is lower among males with bad/fair health. Thus, compared to males with bad/fair health, males who reported that their health hampered their daily activities – LLSI - are more likely to hold a temporary contract in Sweden.

Figure 6. Permanent and temporary work contract prevalence in Denmark, Norway and Sweden by Age x LLSI.

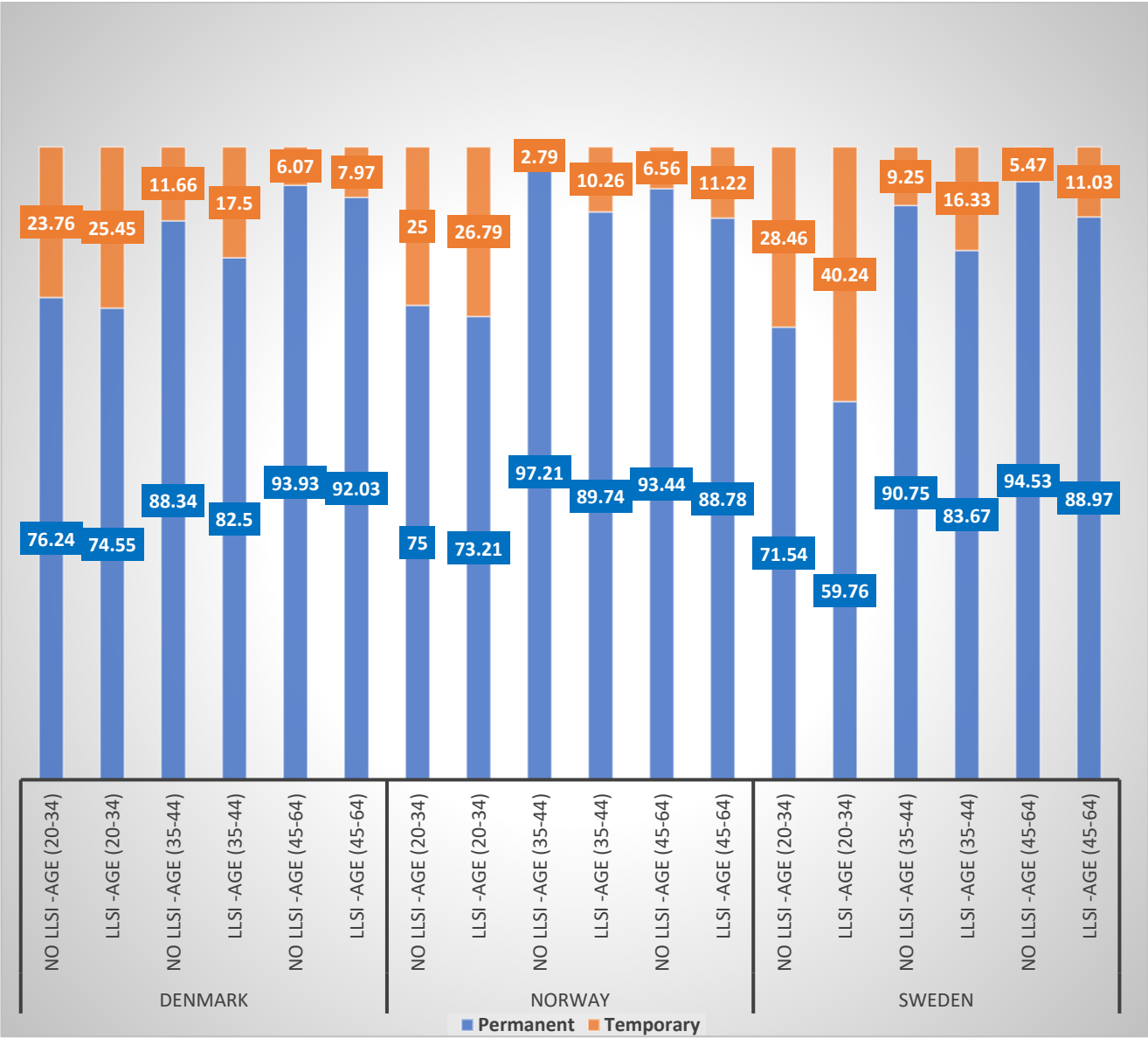


Figure 6 shows the interaction between age and people whose daily activities were hampered by health – LLSI. Age was divided into three age groups – age\_group1 (20-34 years), age\_group2 (35 – 44 years), and age\_group3 (45-64 years).

In Denmark, both age\_group1 with LLSI and without LLSI had a higher prevalence of temporary work contract (25.45 vs 23.76) followed by age\_group2 but with a higher percentage for age\_group2 with LLSI (17.50) than age\_group2 without LLSI (11.66). Temporary work contract prevalence was low among age\_group3 with no LLSI (5.92) and with LLSI (7.59).

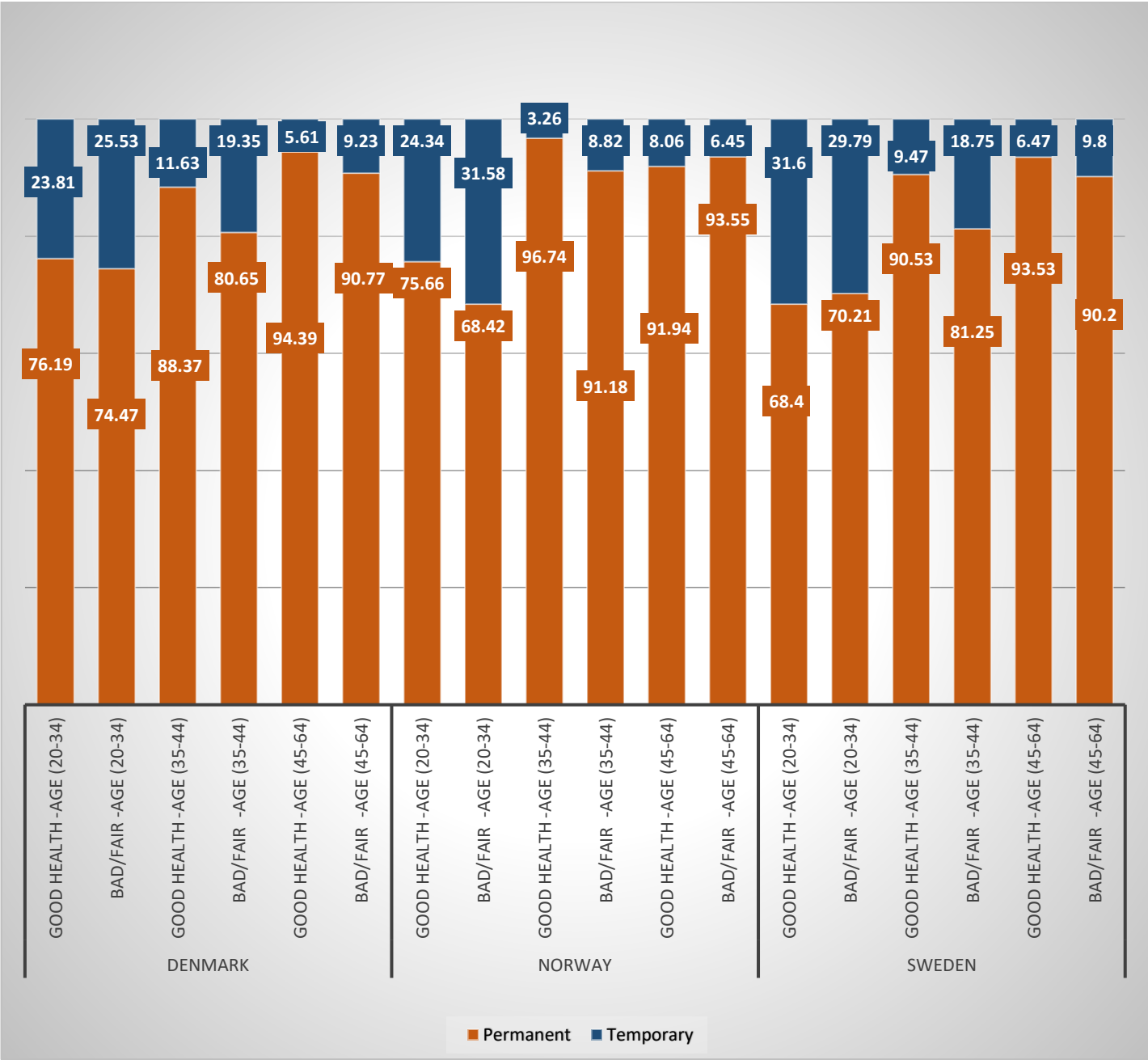
Like Denmark, temporary work contract prevalence is over-represented by the age\_group1 for those with LLSI (26.79) and No LLSI (25.00) in Norway. In age\_group2 and age\_group3, temporary work contract prevalence is high among those who reported LLSI but with lower percentages when compare to age\_group1. Temporary work contract in Sweden is also very high among people in age\_group1 with LLSI (40.24) – higher than what was observed in Denmark and Norway. The prevalence for people without LLSI (28.46) and within age\_group1 is higher than age\_group2 (9.25) and age\_group3 (5.47) in Sweden.

The main observation in the interplay of health and age is the higher prevalence of temporary work contract among the younger age group (20-34 years). This higher prevalence is evident in people in age\_group1 who reported LLSI and those who did not report LLSI. This implies that people with relatively younger age are more likely to hold temporary work contract contracts in all three countries This quite confirms the hypothesis that temporary work contract will be highly prevalent among the youth.

Figure 7 represents the interplay of age and subjective general health. Age was subdivided into three groups just like in Figure 6. The prevalence of temporary work contract was high among people in age\_group1 and who reported both good health and bad/fair health in all the three countries – Denmark (25.53 and 23.81), Norway (31.58 and 24.34) and Sweden (29.79 and 31.60).

These percentages are quite similar to those observed among age\_group1 and LLSI in Figure 6. The major disparity is in Sweden where temporary work contract prevalence for people in age\_group1 with LLSI (40.24) differs strikingly from those in age\_group1 with bad/fair health (29.9). Thus, the likelihood of holding temporary employment is very high among people who reported LLSI than those who reported bad/fair health on the self-rated health measure.

Figure 7. Permanent and temporary work contract prevalence in Denmark, Norway and Sweden – Age x Subjective Health.



**6.2.1 Permanent and temporary contract prevalence among people with specific health problems.**

Table 9 gives the prevalence of permanent and temporary employment among people who reported that certain specific health conditions hampered their daily activities compare to people without such limitations. The health conditions include neck and back pain, muscular and joint

pain in the arm/hand, muscular and joint pain in the foot/leg, and severe headache. The rest are allergies, and stomach and digestion related problems<sup>2</sup>.

Table 9. Permanent and temporary contract prevalence among people with specific health problems.

Country	Employment type	Allergies	No Allergies	Back and neck pain	No Back and neck pain	Muscular pain in foot/leg	No Muscular pain in foot/leg	Muscular pain in arm/hand	No Muscular pain in arm/hand	Severe Headache	No Severe Headache	Stomach or Digestion related	No Stomach or Digestion related
Denmark	permanent	37 (77.08)	756 (87.60)	208 (88.88)	585 (86.41)	117 (88.64)	676 (86.77)	106 (90.60)	687 (86.52)	68 (80.95)	725 (87.66)	47 (85.45)	746 (87.14)
	temporary	11 (22.92)	107 (12.40)	26 (11.12)	92 (13.59)	15 (11.36)	103 (13.23)	11 (9.40)	107 (13.48)	16 (19.05)	102 (12.34)	8 (14.55)	110 (12.86)
Norway	permanent	28 (82.35)	750 (88.13)	156 (86.66)	622 (88.22)	91 (90.00)	687 (87.62)	89 (86.40)	689 (88.10)	58 (84.05)	720 (88.23)	40 (80.00)	738 (88.38)
	temporary	6 (17.65)	101 (11.87)	24 (13.33)	83 (11.73)	10 (10.00)	97 (12.38)	14 (13.60)	93 (11.90)	11 (15.95)	96 (11.77)	10 (20.00)	97 (11.62)
Sweden	permanent	26 (83.15)	843 (84.30)	170 (84.15)	699 (84.21)	76 (77.55)	793 (84.90)	74 (83.14)	795 (84.30)	74 (83.15)	795 (84.30)	53 (79.10)	816 (84.55)
	temporary	7 (16.85)	156 (15.70)	32 (15.85)	131 (15.79)	22 (22.45)	141 (15.10)	15 (16.86)	148 (15.70)	15 (16.85)	148 (15.70)	14 (20.90)	149 (15.45)

The aim is to find out if temporary employment is over-represented among people who reported having of the above-mentioned health conditions. However, it is evident from the table that permanent and temporary work contracts are equally distributed among people who reported the six conditions and those without the conditions in Table 9, albeit with some few exceptions. For instance, in Denmark, temporary contract prevalence is higher among people who reported severe headache (19.05) than those without severe headache (12.34).

In Norway, temporary contracts were highly prevalent among people who reported allergies (17.65 vs 11.87), stomach and digestion related problems (20 vs 11.62), and severe headache (15.95 vs 11.77). In Sweden, temporary contract prevalence was higher among people who reported muscular and joint pain in the foot/leg (22.45 vs 15.10) and Stomach and digestion related problems (20.40 vs 15.45). The comparisons are made to people who did not report or marked any of the conditions.

<sup>2</sup> Compared to the other health conditions, allergies, and stomach and digestion related problems have relatively low observations. The results should therefore be treated with caution as the fewer observations could decrease the statistical power of these two health conditions. These health conditions were however included in the analysis because the observations were on average well above the health conditions in appendix I.



## **6.3 Multivariate Ordinary Least Square (OLS) Regressions**

The main objective for performing the multiple linear regressions was to examine the statistical association between in health and temporary work contract, as compared to permanent work contracts. I elaborate on the cross-national differences in the associations between health and temporary work contract likelihood, and the effect of the interplay of the sociodemographic variables and health on temporary work contract prevalence.

I started by analyzing the potential influence that health and sociodemographic variables could have on a temporary work contract, while juxtaposing the findings with permanent work contract. I then looked at the interplay between the sociodemographic variables and health status on the likelihood of holding a temporary work contract. Lastly, I examined the statistical association between the specific health conditions (ref: section 6.1.2) and temporary work contract prevalence in Denmark, Norway, and Sweden.

The coefficients for permanent employment were the direct opposite of the coefficients for temporary employment (but same percentages). Thus, an increase in temporary employment by 10 percent had a corresponding 10 percent decrease in permanent employment. I, therefore, devoted more attention explaining the temporary work coefficients in the multivariate OLS regression analyses.

### **6.3.1 Ordinary Least Square regression for Employment, health and gender, age, and gender.**

Table 10 gives an overview of the associations between the dependent and independent variables. The aim is to find out if there are any between-country differences in the statistical associations under scrutiny. The constant of 0.0481 (4.81%), 0.052 (5.2%), and 0.0134 (1.34%) represent the percentages for males who reported no LLSI, with high education, and those within the oldest age group in Denmark, Norway, and Sweden respectively.

Temporary contract for people with LLSI, as compared to no LLSI, increased in Denmark by 1.96 percentage points and 3.4 percentage points in Norway, none representing a significant increase. However, temporary work contract prevalence increased significantly for LLSI only in Sweden by 7.52 percentage points (0.0752,  $p < 0.01$ ).

Thus, people who reported LLSI have a 7.52 percent point higher likelihood of holding temporary contracts than those with no LLSI in Sweden. No significant positive relationship was observed among people with bad/fair health in all the three countries (see Appendix II). This implies that people with health conditions that hampered daily activities have a higher chance of holding a temporary work contract in Sweden than those who reported bad/fair health in general.

Table 10. OLS regression model based on temporary work contract, LLSI, age, education and gender in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.0481	0.052	0.0134
LLSI	0.0196	0.0365	0.0752**
Primary education	0.0759**	0.0912**	0.0125
Secondary education	-0.0103	-0.0018	0.0466*
Age group1 (20 -34)	0.1741****	0.1843****	0.2474****
Age group2 (35-44)	0.0693**	-0.0273	0.0531*
Female	0.0105	0.0135	0.0071

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

Higher education was used as a reference category for the educational levels. Primary education has a coefficient of 0.0759 ( $p < 0.05$ ) in Denmark, and 0.0912 ( $p < 0.05$ ) in Norway. This indicates that compared to higher education, primary education predicts 7.6 percent and 9.12 percent points increase in temporary employment contracts in Denmark and Norway. Sweden rather has a 1.25 percent higher temporary contract rate which is not significant. Compared to higher education, primary education predicts a significant positive relationship with temporary work contracts in Denmark and Norway and not in Sweden. Thus, people with a lower level of education are not too disadvantaged among those who are in the Swedish labour market.

Temporary work contracts decrease with secondary education in Denmark (1.03%) and Norway (0.18) but insignificant so. However temporary work contract increases significantly with secondary education in Sweden (4.6%  $p < 0.10$ ).

Age (45 – 64 years) was used as a reference category. People within age group1 (20 – 34 years) are associated with significantly higher ( $p < 0.001$ ) temporary work prevalence in all the three countries with the largest coefficient in Sweden (24.74%). In Denmark, the likelihood of holding a temporary work contract increases significantly by 17.41 percentage age points for people within age group1. Temporary work contract prevalence also increases significantly by 18.43 percentage points for people within age group 1 in Norway. This implies that people with relatively younger age are exposed to temporary work contracts.

Temporary work contract statistically associated with age group2 in Denmark (0.0693,  $p < 0.05$ ) and Sweden (0.0531,  $p < 0.10$ ) but with smaller coefficients when compared to the percentages in age group1. Temporary work contract prevalence reduces for people within age group 2 in Norway. Thus, the prevalence of temporary work contract decreases with increased age.

Being a female increase the likelihood of holding a temporary work contract slightly in all the three countries, but the difference is not significant.

### 6.3.2 Multivariate OLS regression for interactive variable influence on employment.

The models in Tables 11-13 give the OLS regression results of the statistical relationship between temporary and permanent work contract, and the interplay with the covariates age, education, and gender in the three countries.

Table 11. OLS regression model on temporary work contract and LLSI x Age in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.0608	0.0656	0.0548
Age group (20 -34)	0.1769****	0.1844****	0.2298****
Age group (35 -44)	0.0558	-0.0376	0.0377
LLSI	0.0191	0.0466	0.0556
Age group (20 -34) *LLSI	-0.0021	-0.0288	0.0622
Age group (35 -44) *LLSI	0.0394	0.0279	0.0151

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

The constants in the model in Table 11 represent people with no LLSI and in age group3 (45 – 64 years) – the reference group. Temporary work contract constants were 0.0608 (6.08%), 0.0657 (6.57%), and 0.0548 (5.48%) for Denmark, Norway, and Sweden respectively. Temporary contract prevalence is, therefore, very low among people in the reference group. Other variables were compared to the reference group to observe the percentage point increase or decrease in temporary work contract prevalence.

The model looked at the impact of the two age groups – age group1 and age group2 on temporary work contract prevalence, and the impact of health on temporary work contracts. This was followed by the measurement of the impact of the interplay of health and age on a temporary work contract.

Temporary work contract prevalence increases significantly by 17.69 ( $p < 0.001$ ) percentage point for age group1 in Denmark. The percentage increase in temporary work contract in Norway is 18.44% ( $p < 0.001$ ), which is slightly higher than Denmark and this is also significant. The increment was highest in Sweden, with a significant percentage point increase of 22.98 ( $p < 0.001$ ). Similar to the model in Table 10, temporary contract prevalence, increases with age group1, the younger age group significant in all three countries. Thus, confirming the labour market attachment disadvantage among people within this age group.

Temporary contract prevalence increases by 5.58 percent and 3.77 percent in Denmark and Sweden and decreases by 3.76 percent in Norway for age group2. Though none of these percentage points is significant, the lower percentage point increase in Denmark and Sweden and the decreased percentage point in Norway in age group2 affirms that temporary contract decreases with old age.

Temporary contract prevalence increases with LLSI in Denmark (1.91%), Norway (4.66%), and Sweden (5.56%). Compare to people with no LLSI, LLSI though increases the likelihood of holding the temporary contract, the coefficient is quite minimal and not statistically significant.

There was no statistical association in the interplay of age x health, and temporary work contract. The percentage increments were 0.21%, 2.88% and 6.22% for age group1\*LLSI in Denmark, Norway, and Sweden respectively, when compared to age group3\*no LLSI – the reference group. We can infer from the results that age mostly accounted for the higher temporary work contract prevalence in age group1 and not necessarily ill health. The results for the interplay of health and age group2 showed no statistical significance in the percentage point increments in temporary

work contract emanating from the interplay of age and health. However, we can observe from the model that the percentages are now higher in Denmark (3.94%), followed by Norway (2.88%) and least in Sweden (1.5%).

Table 12 shows the results of the interplay of education and health, and their relationship with temporary contract prevalence. The constants in this model represent people with higher education and no LLSI – the reference group.

Table 12. OLS regression model based on temporary work contract and LLSI x Education in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.125	0.1033	0.1227
Primary education	0.0777*	0.0489	-0.0511
Secondary education	-0.0184	0.0105	0.0348
LLSI	-0.034	0.0396	0.0097
Primary educ*LLSI	0.0354	0.0774	0.0788
Secondary educ*LLSI	0.0643	-0.0187	0.0745

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $\leq 0.10$

Temporary work contract constants from the Table 12 were 0.125 (12.5%), 0.1033 (10.33%), and 0.1227 (12.77%) for Denmark, Norway, and Sweden respectively. Other variables were compared to the reference group to observe the percentage increase or decrease in temporary work contract prevalence based on the education level and health status. The model looked at the impact of the two education dummies – primary and secondary education on a temporary work contract. The impact of health and education were assessed separately and then together as interplay (LLSI\*education) variables.

Temporary work contracts increased significantly with lower level of education (primary education) in Denmark with 7.77 percent ( $p < 0.10$ ). It also increased in Norway by 4.89 percent

but not significant. In Sweden, temporary work contracts rather decrease with primary education by 5.11 percent when compared to higher education, though not statistically significant.

Temporary work contracts decreased with secondary education in Denmark (1.84%) but increased with secondary education in Norway (1.05%) and Sweden (3.48%). These are very low percentages and were not statistically significant. Temporary contract prevalence also reduces with LLSI in Denmark (3.4%) but increases with secondary education in Norway (3.96) and Sweden (0.97%). Once again, none of the coefficients was a significant increase or decrease. The interplay of education, both primary and secondary education, and ill health (LLSI) had no significant effect on temporary work contract prevalence in any of the country.

Table 13. OLS regression model based on temporary work contract and LLSI x Gender in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.1324	0.1100	0.1330
Female	-0.0110	0.0029	0.0143
LLSI	0.0016	0.0091	0.1192**
Female*LLSI	0.0167	0.0615	-0.0908*

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

Table 13 shows the results on the interplay of gender and health and their influence on temporary contract prevalence. The constant or reference category is males with no LLSI. The constant for the relationship between temporary contract and LLSI\*gender was 13.24% in Denmark, 11% in Norway, and 13.30% in Sweden. Compared to males, there was no significant effect on temporary contract prevalence in any of the countries – temporary contracts decreased by 1.10% in Denmark, increased by 0.29% in Norway, and increased by 1.43% in Sweden for females. The temporary contracts increased with LLSI by 11.92% ( $p < 0.05$ ) in Sweden when compared to people with no LLSI and it's statistically significant. The percentage increase in Denmark (0.16%) and Norway (0.91%) are very small and not statistically significant. Temporary work

contracts reduce significantly by 9.08% ( $p < 0.10$ ) for females with LLSI when compared to males without LLSI in Sweden. Thus, females with poor health are less likely to hold temporary work contracts in Sweden. Temporary contracts increased for females with LLSI in Denmark (1.67%) and Norway (6.15%) but not statistically significant.

### 6.3.3 Multivariate OLS regression for specific LLSI conditions.

Table 14 shows the results of the relationship between temporary work contract and people who reported that their daily activities were hampered by allergies, neck and back pain, muscular and joint pain in the arm/hand, muscular and joint pain in the foot/leg, severe headache, and stomach and digestion related conditions.

Table 14. OLS regression model for temporary work contract and selected health conditions in Denmark, Norway, and Sweden

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Allergies	0.0824*	0.0518	0.0287
Neck and Back pain	-0.0247	0.0183	-0.0030
Muscular and joint pains in the arm/hand	-0.0185	0.0148	0.0289
Muscular and joint pains in the foot/leg	-0.0145	-0.0160	0.0902**
Severe Headache	0.0702*	0.0425	-0.0169
Stomach and Digestion Related Conditions	0.0419	0.0359	0.0114

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

These health conditions were selected because of two reasons. Firstly, these conditions have a larger number of observations adequate for statistical analysis. Secondly, apart from allergies, the other conditions could be observed easily by employers and thus, could affect their hiring/firing decisions, and transition from temporary contract to permanent contract decisions. It should be noted that mild forms of these conditions might be difficult for employers to observe. However, since people with these conditions asserts that they hampered their daily activities, employers are more likely to notice these conditions among some temporarily employed workers. Thus, the coefficient of allergies and those of the other conditions will be monitored to see if there are any difference.

One health condition dummy was included in a regression model at a time (controlling for age, gender and education). This was done because of the correlation among the health conditions (see appendix vi to appendix vii). The results in Table 14 are the coefficients of each health condition taking from each of the six regression models.

Three conditions – allergies, muscular and joint pains in the foot, and severe headache– had a significant statistical relationship with temporary work contract. However, the relationships were observed in different countries. Allergies had a significant increasing percentage point of 8.24% ( $p < 0.10$ ) on temporary work contract prevalence only in Denmark. The percentages observed in Norway (5.18%), and Sweden (2.87%) were not significant. Temporary contract among people who reported muscular and joint pains in the foot/leg increased significantly by 9.02% ( $p < 0.05$ ) only in Sweden. Similarly, people who reported a severe headache in Denmark have 7.02% ( $p < 0.10$ ) significantly difference in temporary contract prevalence. This pertains only to Denmark. None of the conditions had a significant positive association with temporary work contract in Norway.

It is obvious from the result that even the three health conditions related to temporary work contract sporadically. It is only in Denmark that two conditions – allergies and severe headache significantly affect temporary contract prevalence. However, these conditions were significant on a 10% error margin and should, therefore, be interpreted with caution. It should also be noted that allergy is not a health condition that could be spotted easily by employers. Moreover, though not significant, neck and back pain, muscular and joint pains in the foot/leg, and muscular and joint pains in the arm/hand had a negative relationship with temporary work contracts in Denmark. Thus, people with these conditions have a decreased temporary contract prevalence when compared to people who did not report these conditions. Similar observations were made in Sweden among people with neck and back pain and muscular and joint pains in the arm/hand and for people with muscular and joint pains in the foot/leg in Norway. It therefore quite difficult to conclude based on the four conditions that increased temporary contract prevalence in separate countries that temporary contract increases significantly with ill health. Or conclude that employers discriminate against employees with these specific health conditions.



## **7 . DISCUSSION**

### **7.1 Study Objective**

This study aimed to examine the effect of health on temporary work contract prevalence in Denmark, Norway, and Sweden. The focus was on health inequalities in temporary employment among people who reported specific health conditions. Cross-sectional data from ESS round 7 (2016) was used for the analysis. I first evaluated to find out the difference in temporary contract prevalence among people with LLSI and those without LLSI in the three countries. Based on this, I observed the differences in health inequalities in temporary contracts between people with good and bad health in the three countries. The interplay between age, education, gender, and health on the likelihood of holding a temporary employment contract was also examined.

Finally, the effects of people who reported allergies, neck and back pain, muscular and joint pain in the arm/hand, muscular and joint pain in the foot/leg, severe headache, and stomach and digestion related conditions on temporary work contract were analyzed.

### **7.2 Main Findings**

Based on the descriptive statistics temporary employment was highly prevalent in Sweden with 15.80 percent of total employment contracts (permanent and temporary contract). The prevalence in Denmark (12.95%) and Norway (12.10%) were not much different, however, these percentages were strikingly different from the Eurostat numbers in Figure 1 (7.7% for Denmark and 7.1% for Norway). The possible reasons for these differences are explored further in the limitations section.

Temporary work contract prevalence for people who reported limiting long-standing illness (LLSI) was also higher in Sweden than those who reported none (20.65% vs 14.02%). Thus, higher temporary employment in Sweden, corresponded with higher temporary contract prevalence among people who reported LLSI. Temporary work contract prevalence among people who reported subjective bad/fair (16.57%) health is lower than those who reported LLSI in Sweden. Thus, more health inequalities were reported among the temporary employed who reported that their daily activities were hampered by their health conditions in Sweden.

The results from the OLS regression model on LLSI in Table 10 were consistent with the descriptive statistics. Temporary work contracts increased with LLSI in all the three countries. However, the results were statistically significant ( $p < 0.05$ ) only in Sweden. Temporary contract prevalence increased by 7.52 percentage points for people who reported LLSI when compared to those who reported no LLSI in Sweden.

The significant increase in temporary work in Sweden reflects the higher temporary employment prevalence among people who reported LLSI in Sweden. Moreover, there was no significant difference in temporary contract prevalence among people who reported general subjective good health and bad/fair health in all the countries (Appendix II). This reiterates the fact that people who reported LLSI are more likely to hold temporary work contract because their conditions hampered their daily activities. Since this was observed in Sweden where temporary contract rate was high and temporary employment least regulated, I infer that health inequalities are likely to increase with higher temporary employment and less employment regulation.

Temporary work contracts were significantly overrepresented by age group1 (20 – 35 years) in all the three countries. The general regression model in table 10 reveals a positive relationship between age group1 and temporary work contracts. When compared to age group3 (45-65 years), temporary contract increased among people of age group1 by 17.41% in Denmark, 18.43% in Norway, and 24.74 % in Sweden. The percentage increase was expectedly higher in Sweden where temporary employment was high and temporary employment regulation is low. In general, the younger age group in employment are more likely to hold temporary work contracts when compared to employees in their prime age. Moreover, the higher percentage recorded in Sweden supports the findings of Gebel and Gieseke (2016) that labour market deregulation with its associated low EPL for temporary employment increases the temporary employment risk among the youth instead of improving their labour market attachment.

Temporary work contracts increase significantly with age group2 (35 – 44 years) in Denmark (6.93%  $p < 0.05$ ) and Sweden (5.31%  $p < 0.10$ ) but decreased in Norway (2.73% - though not a significant decrease). However, the percentage increases in Denmark and Sweden are very low when compared to age group1 implying a decreasing temporary contract trend with old age. Nonetheless, it is quite clear that people in the age range of 35 years to 44 years hold more permanent contracts in Norway than in Denmark and Sweden. This relationship between age group2 and temporary work contract in Denmark and Sweden is not surprising as temporary employment is more deregulated in these countries.

The interplay between age and health showed no significant effect on temporary contract in all prevalence the three countries. Both health and age measures – LLSI\*age and bad/fair\*age – showed no significant influence on good health. Temporary work contract prevalence among the younger age (youth) was not associated with any health inequalities. Thus, employers may hire the youth temporarily probably to access their suitability for the jobs and not necessarily because of ill health – health selection. A similar trend was observed for people in age group2 (35 to 44 years) and temporary work contract. Thus, health status has no significant effects on a temporary work contract in the interplay between age and health.

I argued previously that people holding temporary contract may be disadvantaged in sickness benefits as they may either not qualify or forfeit sickness benefits and work in their ill health state. This they will do in order to please employers as frequent sickness leave could affect the probability of maintaining their current jobs. However, the youth who were overrepresented in temporary contracts are mostly healthy and less likely to depend on sickness benefits, the lack of which could lead to worsened health status. Also, the notion that employers with profit maximizing intents may discriminate against employees with ill health in order to minimized cost through sickness benefits is less supported as those with good or poor health seems to have an equal chance of temporarily employed in the labour market. Based on the age disparities in temporary contract prevalence, we can infer that employers are more likely to consider experience when hiring than health selection in Denmark and Norway. However, both health and age are more likely to be considered in Sweden where ill health had a statistically significant association with temporary work contract prevalence.

On education, temporary work contract related positively with primary education in all the three countries. However, temporary work contracts significantly increased with primary education in Denmark (7.59%  $p < 0.05$ ) and Norway (9.12%  $p < 0.05$ ) but not in Sweden (1.25%). However temporary work contracts increased significantly with secondary education in Sweden with 4% ( $p < 0.10$ ) when compared to people holding permanent work contracts. Thus, chances of holding permanent contract among the employed increases with education in Norway and Denmark. This is rather different in Sweden, where people with a lower level of education are less likely to hold more temporary work contracts than those with secondary education.

The interplay of education and health (education\*LLSI) had no significant relationship with temporary work contract when compared to higher education and no LLSI in all the three countries. Thus, the positive relationship between temporary contract and primary education in

the model in table 10 could be attributed mainly to one's level of education and not health selection. Similar results were observed for people who reported subjective good health or bad/fair health in appendix IV. Employers in Denmark and Norway are more likely to base their hiring decisions on educational attainments than on the health of job seekers. This, however, will be more applicable to the skill or white-collar employees in the Danish system.

The results in Sweden seems to suggest that employers lay less emphasis on higher education when offering temporary contracts in Sweden as primary education had no positive relationship with temporary work contracts like in Denmark and Norway. However, employers do not also base temporary work contract decisions on health alone as the interplay of education and ill health had no statistically significant association with temporary work contract prevalence. Employers in Sweden are more likely to hire based on age and experience more than on educational attainments.

On gender, there was no significant temporary work contract increment among females when compared to males in Denmark, Norway, and Sweden. The model in table 10 indicates that males and females have the same chance of being hired temporarily. The interplay of gender and health (gender\*LLSI) had no significant increment in temporary work contract prevalence in Denmark and Norway. However, temporary work contracts decreased significantly among females who reported LLSI (9.08,  $p < 0.10$ ) in Sweden. Thus, females with ill health are even less likely to hold temporary work contract in Sweden. There was no significant difference in temporary work contract among females who reported poor health in Denmark and Norway. There was, therefore, no statistical associations between ill health and gender, and temporary work contract.

The six specific health conditions that were considered in the regression model in Table 14 mainly revealed no health inequalities in temporary work contract. Three conditions significantly increased with temporary work contract when compared to people who did not report such conditions. People who reported that allergies (8.24%,  $p < 0.05$ ) and severe headache (7.02%,  $p < 0.10$ ) hampered their daily activities had statistically significant increased temporary work contract but only in Denmark. Also, people who marked that their daily activities were hampered by muscular and joint pains in the foot/leg had a 9.02% ( $p < 0.10$ ) increased temporary contract work prevalence only in Sweden. There was no statistically significant association between temporary work and any of the health conditions in Norway.

However, the results from table 14 indicate that though not significant, people who marked neck and back pain, muscular and joint pain in the arm/hand, muscular and joint pain in the foot/leg had decreased temporary work contract prevalence in Denmark, when compared to people who did not mark these conditions. A similar decreasing temporary contract trend was observed among people who marked Neck and back pain, and severe headache in Sweden. Moreover, from Table 9, the number of observations for the temporary employed who reported allergies and stomach and digestion related condition was quite lower when compared to the other four health conditions. The results should, therefore, be interpreted carefully because of the fewer observations with associated low statistical power.

In general, the theory that employers may hire healthy people permanently and those with ill health temporarily because of their proxy for production is less supported based on the specific health conditions analyzed in the study. Employers are rather more likely to consider experience and educational attainments in their hiring decisions and not necessarily health selection. Nonetheless, the fact that there was a statistical association between severe headache and temporary work contract in Denmark and muscular and joint pains in the leg/foot and temporary work contract in Sweden, needs further attention. Severe headache that hampers one's daily activities is more likely to be observed by employers and could influence their hiring decisions, especially in a country like Denmark where the unskilled labour force is more prone to temporary work. Similarly, muscular and joint pains in the leg/foot that hamper one's daily activities could also be observed by employers in the Swedish system that is embracing the labour market deregulation principles.

The lack of statistical association between temporary employment and any of the health conditions in Norway may be attributed to the strict EPL and low temporary work contract prevalence. However, the prevalence of temporary work (and for that matter health inequalities in temporary employment) in Norway could be rising because of the recent changes in the Working Environment Act that have made it more flexible for employers to hire up to 15% temporary employees in their firms. This flexibility also implies that employers could observe employees for some time and assess their productive capabilities. People with ill health could be disadvantaged greatly as their poor health conditions may prevent them to compete competently in the labour market. From the hiring perspective, employers may hire more people with ill health. However, their chances of holding their jobs until they move to permanent employment might be very meagre as their productive capacities may be way below expectation. Risk-averse

employers are, therefore, more likely to either lay off or keep such employees in temporary employment for further productivity assessment.

### **7.3 Limitations**

Like most cross-sectional study, there were some limitations to this study, therefore, the outcomes should be understood with a degree of caution. Two possible errors that could affect the data quality and for that matter, the research findings are nonresponse error and coverage error. “Nonresponse error reflects an unsuccessful attempt to obtain desired information from an eligible unit, whereas coverage error reflects the failure to have the sample unit uniquely included in the frame” (Cornish 2002). Nonresponse error affect statistical results in two ways; (i) it contributes to an increase in sampling variance of estimates as the effective sample size is reduced from that originally sought, (ii) nonresponse and coverage errors contributes to bias of estimates when non respondents differ from respondents in the characteristics measured or those not captured in the sample differs strikingly from the respondents (Cornish 2002).

Where the nonresponse from people who reported bad health was lower – probably due to their health status and their unwillingness to give out information on their health status- temporary employment prevalence may be lower among these respondents. For instance, temporary contract prevalence among people with bad health could be lower in Norway if respondent were more reluctant to give information on their health status in Norway than respondents in Denmark. Thus, individual difference in response to the survey questions could lead to differences in health inequalities in temporary work contract prevalence in the countries. Temporary contract prevalence could also differ between the different countries based on coverage – the number of people with good health or bad health who were captured in the sample or the survey. Temporary work contract among those who reported bad health could be lower due to their health status – reduced ability to perform the survey – and perhaps those with worse health may not be covered. In that case, lower health inequalities in the temporary contracts for instance in Norway could be attributed to coverage error and not the lower temporary employment rate.

On contract type – permanent or temporary, the results could be biased if the respondents include people who were temporary employed because of their less engagement in labour activities. A possible occurrence could be observed in the temporary work contract prevalence in Denmark and Norway. The disparities in temporary employment rates in the Eurostat data in Figure 1 and temporary employment prevalence from the study data in Table 7 seems to suggest that people

with temporary contracts were better covered in the respondents than those with permanent work contract. This implies that the temporary employment estimates in the ESS dataset are biased when compare to data from Eurostat.

This was particularly so in Denmark and Norway with Eurostat temporary employment rate of 7.7% for Denmark and 7.1% for Norway as against the temporary employment prevalence of 12.95% and 12.10 for Denmark and Norway respectively in the ESS dataset. In this regard, the results on the health inequalities in temporary work contract prevalence in Denmark and Sweden should be interpreted with a level of caution, as the relatively high temporary employment prevalence in the ESS data could increase the number of temporary employed who reported bad health. On the part of Sweden, the temporary employment rate from the Eurostat data (14.90) and the prevalence observed in the ESS dataset (15.80) was quite similar. Thus, health inequalities in temporary employment are likely to be similar too, implying that the results on health inequalities in Sweden could be interpreted with a level of certainty when compared to the Eurostat temporary employment rates. However, this could not be conclusive since people who reported bad health in Sweden could still be under-represented in the ESS dataset.

The minimal emphasis laid on the long-standing aspect of the LLSI health measure in the ESS dataset is another concern. This made it quite difficult to distinguish between people whose ill health hampered their daily activities for a longer or shorter period. The observations could thus, include people with ill health for a short period, which is less likely to be observed by employers and in effects influence their employment decisions. Health inequalities in temporary employment among people with long-standing illness could be underrepresented as the health measures seem to capture general limiting ill health – acute or chronic.

Another limitation of this cross-sectional study is the low response rate or temporary contracts observed for the specific health conditions considered for the analysis. The data from ESS round 7 was particularly deployed for the statistical analysis because of the enormous amount of health information available in it, especially the observations of specific health conditions. However, because of the lower number of observations, merely six out of the twelve health conditions in the dataset were considered in the statistical analysis. Observations for two of these six conditions – allergies, and digestion and stomach conditions – were still comparatively lower than the other four conditions. This may invalidate the results of the study with regard to prevalence assessment and generalization of the results. Moreover, the statistical association between temporary work

and allergies and temporary work and severe headache in Denmark were only significant on  $p < 0.10$  margin of error which is quite high.

Although, this study as a cross-sectional study is useful for characterizing the prevalence of health inequalities in temporary work contract and the differences in the prevalence among the three countries, its inability to demonstrate a temporal relationship limits the ability to infer causation. However, the study can serve as preliminary research for further studies into the health inequalities in temporary employment within and among nations with differing health and social policies.

## **7.4 Future Research**

Based on the limitation of this study, there will be opportunities for further studies with more data on people with specific health conditions and their employment type. Health inequalities in temporary employment could be determined better with enough observations on employment and health, particularly on health conditions that are more observable, and could influence employers in their hiring or firing decisions.

Additionally, a study that includes a qualitative aspect that garners experiences of employees could be useful. This will enable employees to share their personal experiences on whether their health status had an impact on their employment type or other factors such as age and education are the determining factors and not necessarily ill health.

To make more accurate predictions and generalizations on the health inequalities in temporary employment, it will be ideal to examine employees with ill health and the changes that occur in their employment status after a period of time. Thus, a longitudinal study that follows respondents over a period of time may be useful to determine changes or otherwise of employment type of people who reported bad health and good health. This will also pave way for the usage of more stringent econometric models (e.g. individual-level fixed effects) for data analysis.

Finally, the optimal extension of this research would be the link between labour and health data from administrative registers to develop a possible database that could be used for comparative analysis. The possible accomplishment of this broad data could enhance comparative analysis of the relationship between health and temporary contract. More observations on employment type



and specific health conditions will enhance statistical analysis and improve the generalizability of the findings.

## 8 . CONCLUSION

The rise in temporary employment and its associated health implications is a concern for outsiders in the labour market, especially youth and people with ill health. *Labour market deregulation* has been proposed as a tool to help integrate outsiders into the labour market but it might as well lead to increased temporary employment and further segregation in the workforce, thereby widening the insider-outsider gap. People with ill health may be prone to holding more temporary work contracts (increased health inequalities in temporary employment) if employers are profit maximizing, risk-averse and/or use health as a proxy for expected productivity level. The flexibility to hire and fire employees due to weaker employment protection allow employers a longer probationary period to assess the productive capabilities of employees. Those with ill health may be disadvantaged as their health could affect their productivity level. As a result, they could be fired or remain in temporary employment instead of advancing into permanent employment.

Studying health inequalities in temporary employment is vital for both the individual and the society at large. To the individual, his or her already poor health could see further deterioration, possibly limiting his or her active participation in society. This further deterioration could lead to the use of more health resources and the reliance on sickness benefits, thereby depleting state resources that could have been channelled into other sectors of the economy.

The study, therefore, examined inequalities in temporary work contract prevalence in three countries – Denmark, Norway, and Sweden using the round 7 ESS dataset. These three countries were considered particularly interesting because of the similarities in their economic, health, and welfare policies, which minimized cultural variation. However, there are two striking differences – temporary employment rate and the strength of employment protection – which made it intriguing to study temporary work contract prevalence among people with ill health in these three countries.

The study was different from previous studies on LLSI and employment by McAllister (2015) and Heggebø (2016) in that it moved further to examine health inequalities in temporary work contract for people who reported specific health condition, in addition to more general health measures such as LLSI. People who reported 6 out of the 12 conditions available in the ESS data were analyzed to examine the statistical association with temporary work contract. These 6 health conditions include back and neck pain, severe headache, muscular and joint pain in the foot or

leg, muscular and joint pain in the arm or hand, allergies, and digestion and stomach related conditions, and they were considered because of their relatively high number of observations.

Ordinary Least Square (OLS) multivariate regression was deployed to examine the statistical association between temporary employment and ill health. The aim was to figure out if people with ill health are overrepresented among those holding temporary employment, and whether these health inequalities in temporary work contract are more prevailing in Sweden where temporary employment is higher and less regulated than in Denmark and Norway. Another aim was to examine the (potential) interplay(s) between ill health and age, gender, and education on temporary work contract prevalence.

The results revealed a statistical association between ill health and the prevalence of temporary work contracts in Sweden. Thus, people with ill health held more temporary work contracts in a Scandinavian country where temporary employment rate was higher and employment protection for temporary work was lower. In other words, the higher temporary employment rate corresponded with larger health inequalities. There was no apparent interplay between age, gender, education, and health on temporary work contract likelihood in any of the investigated countries. However, people within age group1 (20-34 years), held more temporary work contracts in all three countries. Three out of the six specific health conditions examined had a statistical association with temporary work. Allergies and severe headache had a statistical association with a temporary work contract in Denmark, whereas muscular and joint pains in the foot/leg statistically associated with temporary work contract in Sweden.

The results of the study should, however, be interpreted with caution because of some data limitations, including potential bias in the ESS data on temporary employment prevalence in Denmark and Norway when compared to the official temporary employment rate from Eurostat. This could affect the generalizability of the results as the number of people reporting ill health in Denmark and Norway may not be a representative sample. The number of people with ill health could perhaps be underrepresented because of non-response due to their health status. In addition, the number of observations for the specific health conditions considered in this study were still rather low, which could affect the statistical power of the analysis.

Despite the limitations, higher temporary work contract prevalence in Sweden is a concern and throws more light on the need to reconsider labour market flexibility regulations, and also support calls in Sweden for full-time and open-ended employment to be the normal form of employment

(Eurofound 2010). It also raises concerns in Norway where recent changes in the Working Environment Act allows more flexibility for the use of temporary contract – which now can encompass 15% of employees in businesses. This implies that the current temporary employment situation in Norway may be rising and might be different from the Eurostat temporary employment rate and the rate reported in the ESS data. This may also lead to a possible increase in the number of people with ill health in temporary employment.

Moreover, though the number of observations for the specific health conditions examines in the study were low, there was a statistical association between allergies and severe headache and temporary work contract in Denmark, where rules on employment protection are skilled based. The skill component in the Danish system makes employment protection more stringent for the white-collar (skilled) workers than for manual or unskilled workers. Thus, temporary employment prevalence and, for that matter, health inequalities in temporary employment may differ between these two skilled groups.

Finally, although this study is cross-sectional and thus not suited for causal inference because it is unable to establish temporal order, it can serve as preliminary research for further studies into health inequalities in temporary employment within and between countries with differing health and social policies. Future research should examine temporary employees for longer periods to determine e.g. changes in their health after a period of temporary employment using econometric models that are more suited for causal inference. There is also a need for more data on specific health conditions, and especially so for chronic health conditions that could affect productivity, and are relatively easy for employers to observe. This could tell us something about employers' attitudes toward people with ill health in the labour market. Lastly, studies that examine ill health and temporary work in Denmark with a focus on the skilled component in employment protection legislation will be ideal to better understand the differences in health inequalities in temporary employment.

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# 10 . APPENDIXES

## Appendix I

Permanent and temporary contract prevalence among people with specific health problems – the other 6 health conditions that were not considered in the statistical analysis due to low observations.

Country	Employment type	Breathing problems	No Breathing problems.	Diabetes	No Diabetes	Heart/circu Problems	No Heart/circu Problems	HBP	No HBP	Cancer	No Cancer	Skin related conditions	No Skin related conditions
Denmark	permanent	18 (85.71)	775 (87.07)	5 (71.42)	848 (87.96)	18 (85.71)	775 (87.07)	10 (70.00)	783 (87.20)	13 (86.66)	729 (86.68)	13 (86.66)	780 (87.05)
	temporary	3 (14.29)	115 (12.92)	2 (28.58)	116 (12.03)	3 (14.29)	115 (12.93)	3 (30.00)	115 (12.80)	2 (13.34)	112 (13.32)	2 (13.34)	116 (12.95)
Norway	permanent	21 (80.76)	757 (88.12)	2 (100)	776 (87.88)	7 (87.50)	771 (88.11)	9 (81.81)	769 (87.98)	9 (100)	730 (87.74)	11 (91.66)	767 (87.85)
	temporary	5 (19.24)	102 (11.88)	0.00	107 (12.12)	1 (12.50)	104 (11.89)	2 (18.19)	105 (12.02)	0 (0)	102 (12.26)	1 (8.34)	106 (12.15)
Sweden	permanent	21 (70.00)	848 (84.63)	2 (100)	867 (84.17)	11 (84.62)	858 (84.20)	11 (84.61)	858 (84.20)	12 (92.30)	802 (88.63)	9 (90.00)	860 (84.14)
	temporary	9 (30.00)	154 (15.36)	0.00	163 (15.83)	2 (15.38)	161 (15.80)	2 (15.39)	161 (15.80)	1 (7.70)	157 (16.37)	1 (10.00)	162 (15.86)

## Appendix II

OLS regression model for temporary work contract by subjective health and covariates, in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.0456	0.0561	0.0253
Bad/fair health	0.0356	0.011	0.0265
Primary educ	0.0746**	0.0955**	0.0186
Secondary educ	-0.0123	-0.0002	0.0504**
Age group (20 -34)	0.1759****	0.1844****	0.2453****
Age group (35 -44)	0.0717***	-0.0284	0.0495*
Female	0.0094	0.0156	0.0115

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

### Appendix III

OLS regression for temporary work contract and Subjective health x Age, in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.0561	0.0807	0.0647
Age group (20 -34)	0.1820****	0.1627****	0.2512****
Age group (35 -44)	0.0602*	-0.0480	0.0300
Bad/fair Health	0.0362	-0.0161	0.0334
Age group1* Bad/fair Health	-0.0190	0.0885	-0.0514
Age group2 *Bad/fair Health	0.0410	0.0717	0.0594

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

### Appendix IV

OLS regression of temporary work contract and Subjective health x Education, in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.1157	0.1125	0.1268
Primary education	0.0986**	0.0614	0.0128
Secondary education	-0.0082	0.0070	0.0487
Bad/fair Health	0.0223	-0.0215	-0.0156
Primary educ*Bad/fair Health	-0.0571	0.0784	-0.0822
Secondary educ*Bad/fair Health	0.0066	0.0178	0.0484

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

## Appendix V

OLS regression of temporary work contract and Subjective health x Gender, in Denmark, Norway, and Sweden.

VARIABLE	DENMARK	NORWAY	SWEDEN
	Estimated $\beta$	Estimated $\beta$	Estimated $\beta$
Constant	0.1279	0.1172	0.1555
Female	-0.0053	0.0048	0.0019
Bad Health	0.0251	0.0349	0.0356
Female*Bad Health	-0.0093	0.0760	-0.0426

\*\*\*\*=  $p \leq 0.001$ , \*\*\* =  $p \leq 0.01$ , \*\* =  $p \leq 0.05$ , \* =  $p \leq 0.10$

## Appendix VI

Correlation coefficients of the 6 health conditions considered in the OLS regression analysis - **Denmark**

	Allergies	Neck and Back pain	Muscular and joint pains in the arm/hand	Muscular and joint pains in the foot/leg	Severe Headache	Stomach and Digestion Related Conditions
Allergies	1.0000					
Neck and Back pain	0.0387	1.0000				
Muscular and joint pains in the arm/hand	0.0326	0.1928	1.0000			
Muscular and joint pains in the foot/leg	-0.0216	0.102	0.3312	1.0000		
Severe Headache	0.0137	0.0859	0.0773	0.0503	1.0000	
Stomach and Digestion Related Conditions	0.1345	0.059	0.1289	0.0981	0.0056	1.0000

## Appendix VII

Correlation coefficients of the 6 health conditions considered in the OLS regression analysis - **Norway**

	Allergies	Neck and Back pain	Muscular and joint pains in the arm/hand	Muscular and joint pains in the foot/leg	Severe Headache	Stomach and Digestion Related Conditions
Allergies	1.0000					
Neck and Back pain	-0.0125	1.0000				
Muscular and joint pains in the arm/hand	0.0257	0.1588	1.0000			
Muscular and joint pains in the foot/leg	-0.038	0.1188	0.344	1.0000		
Severe Headache	0.0259	0.0985	0.047	0.084	1.0000	
Stomach and Digestion Related Conditions	0.0011	0.0249	0.0481	0.0499	0.0511	1.0000

## Appendix VIII

Correlation coefficients of the 6 health conditions considered in the OLS regression analysis - **Sweden**

	Allergies	Neck and Back pain	Muscular and joint pains in the arm/hand	Muscular and joint pains in the foot/leg	Severe Headache	Stomach and Digestion Related Conditions
Allergies	1.0000					
Neck and Back pain	0.0701	1.0000				
Muscular and joint pains in the arm/hand	0.136	0.1327	1.0000			
Muscular and joint pains in the foot/leg	0.0381	0.0877	0.314	1.0000		
Severe Headache	0.0686	0.1058	0.0555	0.0696	1.0000	
Stomach and Digestion Related Conditions	0.1133	0.0811	0.0631	0.0711	0.1292	1.0000