Demanding change?
Employee sickness absence, disability retirement and turnover in response to hospital reorganization

Mari Holm Ingelsrud

Dissertation submitted for the PhD degree
Department of Sociology and Human Geography
Faculty of Social Sciences
University of Oslo
PREFACE

This dissertation would not have been the same without the support and input of my two supervisors. I would like to thank my main supervisor Arne Mastekaasa for raising important questions challenging the assumptions I make and for giving authoritative advice in the use of statistical methods. I would like to thank my co-supervisor Espen Dahl for his inclusive style and caring attention, as well as his comments aimed at lifting my research theoretically.

This dissertation was part of the research project “Reorganizing the specialist health services: what are the individual consequences for the employees” funded by the Research Council of Norway (grant number 193614/S20). In addition to Espen and myself, the project team has consisted of Kari Anne Holte, Thomas Lorentzen, Lars Erik Kjekshus, Vilde Bernstrøm, Svenn-Erik Mamelund, Karin Monstad, Migle Gamperiene, Bjørn Lau, Thomas Lund, Heidi Enehaug, and Randi Aas. Thank you for interesting discussions at project meetings and helpful comments on early versions of the articles included in the thesis.

During the work with this thesis, I was employed at the Social Welfare Research Centre (Sosialforsk) and later at the Department of Social Work, Child Welfare and Social Policy, both at Oslo and Akershus University College (HiOA). The opportunity to be included in an active research environment, to teach and to contribute on other research projects has been an indispensable part of my training. A special thanks to former leader of Sosialforsk, Sissel Seim, for your warm welcome and your competent leadership during the first years of my contract. I have also greatly appreciated the companionship of my fellow research fellows at the Department of Social Work, Child Welfare and Social Policy at HiOA and the Department of Sociology and Human Geography at UiO. Thank you for interested feedback at seminars and for enjoyable lunchtime and coffee-break discussions.

The welfare state and HiOA has provided paid maternity, paternity and breast-feeding leave twice during my scholarship period, allowing me to start a family and care for it whilst working towards the PhD-degree. I feel lucky for not being forced to choose between having a career and having a family. I am also very lucky to share the family with my husband, Ole Bjørn. You are a supporting man, father and partner. A final thanks to our parents for helping us when we need it.

Mari Holm Ingelsrud

Oslo, January 2017
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of articles</td>
<td>vii</td>
</tr>
<tr>
<td>Summary</td>
<td>ix</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>A changing world of work</td>
<td>4</td>
</tr>
<tr>
<td>Organizational change in the Norwegian hospital sector</td>
<td>5</td>
</tr>
<tr>
<td>An institutional backdrop</td>
<td>6</td>
</tr>
<tr>
<td>Theories and previous research</td>
<td>8</td>
</tr>
<tr>
<td>Sickness</td>
<td>8</td>
</tr>
<tr>
<td>Sickness absence</td>
<td>9</td>
</tr>
<tr>
<td>Disability retirement</td>
<td>11</td>
</tr>
<tr>
<td>Turnover</td>
<td>13</td>
</tr>
<tr>
<td>Why does organizational change influence employees’ health and well-being?</td>
<td>15</td>
</tr>
<tr>
<td>How people experience and respond to change</td>
<td>16</td>
</tr>
<tr>
<td>Job quality and stress</td>
<td>17</td>
</tr>
<tr>
<td>Job insecurity</td>
<td>19</td>
</tr>
<tr>
<td>Social inequalities in work and health</td>
<td>21</td>
</tr>
<tr>
<td>Data and methods</td>
<td>22</td>
</tr>
<tr>
<td>Presentation of data</td>
<td>22</td>
</tr>
<tr>
<td>Strengths and weaknesses of the data</td>
<td>23</td>
</tr>
<tr>
<td>Fixed-effects analyses</td>
<td>24</td>
</tr>
<tr>
<td>Timing the effects of organizational change</td>
<td>26</td>
</tr>
<tr>
<td>Summary of the articles</td>
<td>27</td>
</tr>
<tr>
<td>Article 1: Reorganization increases long-term sickness absence at all levels of hospital staff: panel data analysis of employees of Norwegian public hospitals</td>
<td>27</td>
</tr>
<tr>
<td>Article 2: Disability retirement and public sector reorganization: Hospital mergers in Norway</td>
<td>28</td>
</tr>
<tr>
<td>Article 3: Turnover during hospital mergers in Norway: Neither healthy nor unhealthy employees leave the hospital sector</td>
<td>29</td>
</tr>
<tr>
<td>Concluding discussion</td>
<td>31</td>
</tr>
<tr>
<td>Limited impact of the organizational changes</td>
<td>31</td>
</tr>
<tr>
<td>Explaining higher sickness absence without increased turnover</td>
<td>33</td>
</tr>
<tr>
<td>A more demanding, less inclusive working life?</td>
<td>33</td>
</tr>
<tr>
<td>Policy implications and future research</td>
<td>34</td>
</tr>
<tr>
<td>References</td>
<td>37</td>
</tr>
</tbody>
</table>
LIST OF ARTICLES

Article 1

Article 2

Article 3
Ingelsrud, MH. Turnover during hospital mergers in Norway: Neither healthy nor unhealthy employees leave the hospital sector. Under review at *Nordic Journal of Working Life Studies.*
SUMMARY

As in the rest of the industrialized world, organizational changes have been increasingly frequent in the Norwegian hospital sector in recent decades. Due to an ageing population, medical advances expanding treatment opportunities and a lack of labour supply, organizational changes are undertaken to meet the demand for both higher efficiency and better quality in the health services. This dissertation addresses concerns about how rapid organizational change affects employees. The aim is to analyse how organizational changes in the Norwegian hospital sector have affected individual employees’ sickness absence, disability retirement and turnover. Moreover, the dissertation investigates whether some categories of employees thought to have a marginalized position in the labour market due to low education or bad health were more affected by the organizational changes than others. Two types of organizational change are investigated: internal departmental changes and hospital mergers.

The dissertation consists of three papers which use panel data methods to analyse official register data on Norwegian hospital employees between 2000 and 2008. The individual register data was matched to hospital level information on organizational changes gathered through surveys answered by hospital management or collected from the National Patient Register. Article 1 uses individual fixed effects Poisson regression to study the effect of increasing the number of internal departmental changes on the number of registered long-term sickness absence days. The results show a small, but significant increase in sickness absence following increases in the number of changes among all levels of hospital staff. Article 2 uses logistic regression with hospital fixed effects to study whether mergers increase the risk of disability retirement entry amongst hospital staff. The analyses suggest that there is a small increase in disability retirement entry in the second year following mergers, but only for employees with secondary or lower education. Article 3 uses discrete-time survival analysis to investigate whether turnover increases during mergers. Turnover to three destinations (other job within the hospital sector, job in other sector and out of work) is modelled. Moreover, the article investigates whether the effect of mergers on turnover varies according to employees’ previous sickness absence. The analyses found no effect of mergers on turnover out of the hospital sector for either healthy or unhealthy employees. Only turnover within the hospital sector increased following mergers, most likely as a direct and desired effect of the mergers.

Taken together, the results suggest that the organizational changes at the Norwegian hospitals have caused some distress amongst employees in the short term. However, the effects are limited for most employees. The lack of downsizing in the sector in the time period studied
might explain the moderate effects. Furthermore, Norwegian working life is characterized by a high level of unionization. Employee participation is institutionalized both at each individual workplace and at the policy level through the cooperation of the state, employer and employee unions. Given the context of a relatively generous welfare state, the Norwegian working life model offers both employees and companies the security they need in order to take the risk of making necessary adjustments in order to adapt to changing environments. However, I also find a higher risk of entering disability retirement following hospital mergers amongst the lowest educated employees. This calls for some concern as to whether the sum of increasingly frequent small changes may amount to a less inclusive working life in the long run.
INTRODUCTION

This dissertation explores the relationship between work and health, two elements that are central to the organization of social life and that impact the individual’s quality of life. Specifically, I investigate the effect of hospital reorganization on employees’ sickness absence, disability retirement and turnover. The dissertation draws upon theories and perspectives from medical sociology, the sociology of work and organizational sociology. The three outcomes studied here can all be seen as expressions of reduced employee well-being. The study is conducted in the specific context of the Norwegian welfare state and the Nordic model of work organization involving active labour market politics, a high degree of employee participation at all levels of working life and relatively generous health-related benefits.

It is a stated political goal that as many as possible participate in Norwegian working life. Through the Tripartite Agreement on an Inclusive Working Life (the IWL agreement), first signed in 2001, the Norwegian government has invested in measures to reduce sickness absence, include people with disabilities and retain older employees in work. For the individual employee, paid work has both economic and social benefits (Jahoda, 1982). However, work can also be demanding. The negative health effects of various aspects of working life comprises a large field of study. Reorganization is one such aspect, and is assumed to have predominantly negative consequences for employees (Cappelli et al., 1997; Landsbergis, 2003; Westgaard and Winkel, 2011). Both benefits and disadvantages of work are unequally distributed. Prominent examples are the social gradients in work and health, where the lowest educated have the lowest degree of control at work, the worst health and the highest amount of sickness absence (Marmot et al., 2006).

The hospital sector is frequently undergoing changes. Hospitals and their employees continually strive to keep up with technological advancements and new treatment alternatives. The range of treatable diseases is expanding, resulting in an increasing demand for health services. The demographic development, with an increasing ratio of retired to employed citizens, poses a particular challenge in the form of a reduced tax base to pay for the services. Even more urgent is meeting the sector’s demand for personnel (NOU 2010:13, 2010). Organizational changes have been increasingly frequent in the hospital sector over the last 30 years. The recent reforms have been executed to meet the increasing demand for both efficiency and quality. Under the influence of New Public Management (NPM), hospitals have been
merged and there have been numerous departmental changes within hospitals. How have the employees fared during these reforms?

The health and social sector employs more than one fifth of Norway’s workforce. Investigation into the consequences of restructuring for these employees is important in its own right. The sector is distinctive in that it employs a large share of women. Around 80% of the employees are female. The sector also has a generally high rate of sickness absence and disability retirement compared to other sectors. The high rates can mostly be explained by the large share of female employees, since women have a higher risk of sickness absence and disability retirement. However, both men and women employed in the health sector have a higher risk of sickness absence than employees in other sectors (NOU 2010:13, 2010). The combination of a high share of sickness absence and disability retirement, an increasing demand for labour and a high degree of reorganization makes the hospital sector an interesting case to study.

Existing literature on the consequences of restructuring for the employees has mainly been concerned with downsizing. The health-related outcomes of restructuring efforts conducted in several industrialized countries have been summarised by Ferrie et al. (2008). They conclude that two of the manifestations of restructuring – downsizing and increased job insecurity, are associated with higher risk of both physical and psychological ill health. Whilst downsizing is the topic of examination in many studies of reorganization (Kivimäki et al., 2003; Kivimäki et al., 2000; Kolstad, 2005; Martikainen et al., 2008; Quinlan and Bohle, 2009; Rege et al., 2009; Theorell, 2003; Vahtera et al., 1997; Vahtera et al., 2005; Østhus and Mastekaasa, 2010), there is a need to differentiate between downsizing and other forms of organizational change (Østhus, 2007). Staff reductions are often one aspect of large-scale restructuring, and the effects of other organizational changes might be confounded by the effects of downsizing. For instance, whilst privatization led to increased risk of disability amongst public sector workers in the British Whitehall II cohort (Virtanen et al., 2010), no such effects were found in a study of privatization in Finland (Kokkinen et al., 2013). One explanation might be the staff reductions accompanying privatization in the British study (Vahtera and Virtanen, 2013). Studying the effect of organizational change in the Norwegian hospital sector is advantageous because they did not involve downsizing (Kjekshus et al., 2014). Previous studies on the effects of workplace reorganization in the Norwegian hospital sector have shown an increase in sickness absence (Bernstrom and Kjekshus, 2015; Kjekshus et al., 2014; Røed and Fevang, 2007) and disability retirement (Røed and Fevang, 2007). These studies did not examine differentiated effects of
reorganization for different employee categories. There is a need for more research on whether effects of reorganization are unequally distributed (Bambra et al., 2007).

The overarching research question to be answered in this dissertation is:

*How have organizational changes in the Norwegian hospital sector affected individual employees’ sickness absence, disability retirement and turnover?*

Moreover, the dissertation investigates whether some categories of employees thought to have a marginalized position in the labour market due to low education or bad health were more affected by the organizational changes than others.

I analyse the impact of organizational change on sickness absence, disability retirement and turnover using official register data on Norwegian hospital employees from 2000 to 2008. Information on organizational changes was gathered through a survey answered by hospital management or collected from the National Patient Register (NPR). The data are analysed and presented in three studies:

1. Reorganization increases long-term sickness absence at all levels of hospital staff: panel data analysis of employees of Norwegian public hospitals
2. Disability entry during hospital mergers: Are the lowest educated most at risk?
3. Turnover during hospital mergers in Norway: Neither healthy nor unhealthy employees leave the hospital sector

The two aspects of health investigated in the dissertation, sickness absence and disability retirement, have in common that they are work-related. Sickness absence is a benefit awarded to employees who are still in the labour market, whilst disability retirement entails at least a partial exclusion from the labour market. The first study analyses the effect of internal changes on the sickness absence of employees at various levels of the hospital. The second study analyses disability entry during hospital mergers, and investigates differences between employees with high and low education. The third study analyses whether turnover following hospital mergers to other hospitals, other sectors or out of work is dependent on employees’ previous sickness absence.

The following section presents perspectives on the changing world of work and the context of hospital reorganizations in Norway. In the remainder of the introductory chapter, I will present a discussion of the concept of sickness as health in relation to work and society. I move on to present theories and earlier research on how work reorganization may affect sickness and how
employee health may affect the outcomes of organizational restructuring. After that, I provide a description of the data and methods used in the empirical studies, followed by a description of the empirical findings of the three studies. I conclude with a discussion of the empirical findings.

**A changing world of work**

Giddens (1998) posits that society changed fundamentally during the 1980s and 1990s as a result of three major revolutions: “globalization, transformations in personal life and our relationship with nature” (Giddens, 1998: 64). Globalization is witnessed by the direct and immediate impact of distant events on individual lives, and also by the financial markets spanning the world. Individuals increasingly define their own lives and individualization is incorporated, amongst other things in the rights and obligations of the welfare state. Our relationship with nature is increasingly focussed on sustainability, but also the need to actively confront environmental problems with technology and innovation. A new prominence is given to risk as opportunity and innovation in response to danger (Giddens, 1998: 27-64). Critical voices have advocated that increasing flexibility and insecurity are characteristics of the ‘new labour market’ (Green, 2006; Sennett, 1998). Others have warned about the dangers of the spread of precarious work (Standing, 2014). On a more optimistic note, Beck has argued that the ‘second modernity’ involves both increased freedom and responsibility for the individual, challenging authorities to keep up with the “new self-active, self-aware, political civil society” (Beck, 2000: 7-8). Giddens proposes that rather than simply providing their citizens with security, a government’s role is to insure the capability of individuals to take risks in a productive fashion: “People need protection when things go wrong, but also the material and moral capabilities to move through major periods of transition in their lives” (Giddens, 1998: 100).

Fevre (2007) is critical to the idea that we are living in an ‘age of insecurity’. He refers to empirical evidence showing that insecurity is not an inevitable result of flexibility. Nevertheless, important changes to work organization have taken place during the last three decades. Scholars have analysed how these changes affect individuals’ working lives. Through analyses of consistent social survey series, Green (2006) has documented overall increasing job quality in terms of rising wages and skill levels and a diminishing risk of accidents. On the negative side, workers in many Western countries have seen an intensification of work effort, robustly associated with changing technology and work organization (Green, 2006: 66-86). An increase in the rate of change has also been problematized (Cappelli et al., 1997).
The public sector has been restructured in many Western states since the mid-1980s. State fiscal crises from the mid-1970s onwards, coupled with population ageing, growing citizen demands for quality and the globalization of capital markets have all been pressures for change in the way public services are organized. Restructuring has had many forms, including the privatization of services, management reform and subsequent internal organizational change (Hebdon and Kirkpatrick, 2005). Management reform and internal changes have also been prominent in Norwegian public hospitals (Byrkjeflot, 2011). ‘New Public Management’ (NPM) refers to a management style where values of increasing efficiency, avoiding waste and matching resources to tasks are prominent. The core idea is that the public sector should be managed in the same way as corporate firms with user choice, greater competition and explicit measures of performance. Furthermore, where decisions previously were governed by formal rules and professional authority, managers are thought to be able to steer resources more efficiently if they are given more power (Hood, 1991). Accompanying NPM are certain features of organizational restructuring which involve breaking up monolithic and centralized public services into smaller quasi-autonomous business units, including decentralization of management and budgetary responsibility. The introduction of market-like mechanisms is also prominent; e.g. introducing a purchaser-provider split and quasi-contractual relationships between sub-units instead of a system of hierarchical control (Hebdon and Kirkpatrick, 2005).

NPM is not a uniform management style; it is implemented in different ways in different businesses and sectors. In the Norwegian health sector, stated aims of the NPM reforms have been to improve cost control and distribute health resources more equally across regions and municipalities. Moreover, the aims have been to reduce the size of the administration, restrain professional control, develop a more decentralized health care system and empower patients. Management reforms, the introduction of quasi markets and increased organizational autonomy are three aspects of NPM introduced in Norwegian hospitals (Byrkjeflot, 2011).

**Organizational change in the Norwegian hospital sector**

The term ‘organizational change” covers a wide variety of workplace alterations. A much used definition includes changes to the work organization in terms of “goals, structure, technology, tasks, the structure of power and control, the structure of rewards contingent upon membership and performance, and also in terms of the relations between these and the wider social setting including product markets, resource markets, and labour markets” (Carnall, 1986: 748. Emphasis in original text). Large organizations, such as Norwegian hospitals, can be subject to several change processes at once, varying in intensity and scale.
During the 1990s, several reforms have been initiated to amend such problems as inefficiency, long waiting lists, geographical inequity in access to services, persistent economic problems and an unclear division of responsibility between the state and the local level (Møller Pedersen, 2002). Despite the introduction of the patient’s right to choose the hospital they receive treatment at, pay-per-service financing and increases in per capita health expenditures, waiting lists did not go down during the 1990s. Furthermore, the ageing population and a shortage of medical personnel in the near future were seen as threats that could only be dealt with by increased hospital efficiency (Møller Pedersen, 2002: 10). From January 1 2002, the state assumed ownership and responsibility for the hospitals from the counties under the Hospital Enterprise Reform. The political goals were to achieve greater performance, accountability and political control (Lægreid et al., 2004). Initially, the enterprises were to be governed by professional boards with state-appointed representatives, preferably with a business background. However, this was reversed in 2006, when local politicians rejoined hospital boards, although still appointed by the Minister of Health (Hagen and Vrangbæk, 2009). The rest of the organizational structure was chosen to accommodate large-scale production, which was believed to be the most efficient model to contain costs and secure high clinical quality. No purchaser-provider split was executed in Norway.

The Hospital Enterprise Reform of 2002 was itself a large corporate transformation which significantly changed the ownership, funding and business strategy of public hospitals in Norway. Following this reform, hospital mergers have been widespread, initiated to save costs and to achieve higher efficiency and better quality care (Kjekshus and Hagen, 2007). In this dissertation, the changes that have been studied are mergers between hospitals and changes to the departmental structure within hospitals. The increasing rate of mergers and organizational changes witnessed in the hospital sector during the 2000s (Kjekshus et al., 2014) can be seen as an expression of the generally increasing rate of change in modern working life (Cappelli et al., 1997). These changes are likely to involve an intensification of work for the employees (Green, 2006).

An institutional backdrop

Working life institutions play a role in both facilitating organizational change and shaping employees’ response to organizational changes. The economic performance of the Norwegian and other Nordic economies (Sweden, Denmark, Finland and Iceland) at the start of the 21st century has been explained by the balance between market mechanisms and social institutions, leading to efficiency and equality (Freeman, 2013). Unionization amongst employees in the
health sector was 82% in 2014, about the same as in the rest of the Norwegian public sector (Nergaard, 2016). Employee participation is central to the Nordic working life model. It has been argued that the institutionalization of employee participation at all levels, from the individual firm to the national level, facilitates business restructuring in Norway (Løken et al., 2013).

On the other side, the welfare state, with relatively generous unemployment, sickness and disability benefits, offers security to employees in periods when they cannot work. The Scandinavian countries have a history of policy interest in issues relating to improving the quality of work tasks (Gallie, 2003). European evidence suggests that employees in the Scandinavian countries (represented in the EU by Sweden and Denmark), when compared to other EU countries, have relatively better job quality regarding the quality of work tasks and are more involved in decision-making within the organization. Job security, measured by dismissal protection and promotion opportunities within the same company is, however, not especially high in Scandinavian compared to other EU countries (Gallie, 2003). The safety net provided by the welfare state offers security for employees which is not contingent on the relationship with their employer. This facilitates transitions for both employees and employers that increases the willingness to make changes. Active labour market policies and generous benefits increase the capability of employers and employees to take risks.
THEORIES AND PREVIOUS RESEARCH

The following section presents theories on sickness absence, disability pension and turnover. The three measures can all be seen as expressions of reduced employee well-being. Well-being is widely used in the social sciences; the term does not have one definition, but refers to different aspects of feelings of quality of life. Subjective feelings of distress and self-reported mental health (Burchell, 2011; Pollard, 2001) are common measures of well-being. In addition to the health aspect, happiness or satisfaction with life (Diener et al., 2006) are taken as indicators of well-being. Whilst well-being is a term for how people feel, this dissertation studies employees’ behavioural responses to organizational change, with sickness absence, disability retirement and turnover as possible responses. Registered sickness absence and disability retirement obviously concern health, acknowledged by the physician certification that is required to enter them. However, I will argue that they too have a social and motivational component. Turnover can be seen as a response that is more related to job satisfaction. However, there are also reasons to believe that turnover is affected by employee health. This section will therefore start by exploring the concept of sickness before presenting theories on the three outcomes.

Sickness

The recognition that health is a term with meaning besides the evaluation of the physiological or psychological functioning of the body lies at the foundation of medical sociology. Concentrating on the medical, subjective and societal implications of health, the elements of the triad disease, illness and sickness (DIS) are seen as three aspects of health (Twaddle, 1993). Whilst disease describes the objective health state as determined by a medical diagnosis, illness is the individual’s subjective feeling of symptoms. In real life, the division between disease and illness is not so clear cut. Many medical diagnoses are based on the patient’s own description of symptoms and the same symptoms can yield different diagnoses (Maeland et al., 2012). Sickness is a term used to describe a role that the sick person fulfils, with both rights and obligations attached (Parsons, 1958). The sick role involves a right not to work and to be economically compensated by the government for the loss of working capacity. It has been shown that whilst intuitively the concepts of disease, illness and sickness are overlapping, there is little overlap between the categories when measured empirically (Wikman et al., 2005). Some people with a certified disease judge their health as good, whilst some people who judge their health as bad still hold full-time employment.
Parsons (1958) discusses illness in relation to morality and deviance. He sees sickness as a socially institutionalized role type characterized by the incapacity of the individual to meet normal task and role expectations. Inherent in the role type is both deviance and legitimacy. However, the legitimacy is contingent upon the recognition by the sick person that the condition is undesirable (Parsons, 1958). Sickness absence and disability retirement still occur in a sphere occupied by both deviance and legitimacy, and the legitimacy is regularly debated. Due to the fact that sickness-absence benefits and disability pensions are covered by the National Insurance Scheme, the level of sickness absence and disability in the population is a social issue, regularly up for public debate (Rønning, 2011). How we understand sickness absence and disability retirement has implications for the understanding of their development in relation to organizational change. In the next sections, the theoretical and empirical aspects of sickness absence and disability retirement are discussed in turn.

Sickness absence
Sickness-absence benefits are granted to employees who experience a loss of working ability due to illness or disease. The benefits replace 100% of wages up to a limit determined by the government (NOK 537,012 in 2015, above the average salary of NOK 520,800 in 2015) and are paid from the first day of absence. Employers pay benefits for the first 16 days, after which the National Insurance Scheme covers the remainder of the sickness absence period up to one year. After being employed for at least two months by the same company, employees can take self-certified sickness absence for up to three days, a maximum of four times per year (eight days per spell and a maximum 24 days per year if the company has signed the IWL agreement). Longer spells of absence must be certified by a physician.

There is no unified theory of sickness absence, and different fields of knowledge have their own research traditions and theoretical perspectives on sickness absence (Allebeck and Mastekaasa, 2004). Sickness absence is often listed alongside other forms of absence from work, both voluntary and involuntary, and termed absenteeism (Hofmann, 2011). The term ‘absenteeism’ holds negative connotations, and brings into question the legitimacy of each spell of sickness absence. Earlier research has stressed the importance of separating between short- and long-term sickness absence and physician- and self-certified sickness absence. The researchers suggest that the motivational component is greater for short-term absences and self-certified absences than for long-term, physician-certified absence spells (Marmot et al., 1995). Physician certification of a disease legitimizes the sickness absence. However, this does not mean that certified absence spells of a certain length can be reduced to a clean measure of illness. In the
remainder of this section I will present theories arguing that sickness absence is affected both by an individual’s health, the requirements of their job and a motivational component.

A much used model of sickness absence is Steers and Rhodes’ (1978) process model of employee attendance. The model rests upon the assumption that employee motivation is the primary influence on attendance, assuming the ability to attend. The two main factors thought to influence the employee’s motivation are satisfaction with the job situation and internal and external pressures to attend. Illness and accidents are considered “unavoidable limitations to attendance” (Steers and Rhodes, 1978: 400). A view of sickness absence as being either involuntary (caused by bad health) or voluntary and thus illegitimate, is too simple. Sickness absence, whether physician-certified or self-certified, can be understood as a result of both the lacking ability and the lacking motivation to go to work. Barmby et al. (1994) define two critical levels or thresholds of sickness relevant to individuals deciding whether to attend work or not. The first is an upper limit of sickness beyond which the employee is always too ill to work. The second is the level at which the employee is indifferent between absence and non-absence (i.e. the utility of leisure equals the utility of working). The model assumes that increasing wages relative to sick pay increases the utility of working and raises the lower sickness threshold. Recognising that wages is not the only benefit of paid work for the individual employee (Jahoda, 1982), the model can easily be extended to other factors affecting the motivation to attend work.

The Illness Flexibility Model (IFM) seeks to describe the conditions that affect the relationship between illness and sickness absence (Johansson, 2007). According to the IFM, illness affects the capacity of an individual. However, reduced capacity in itself does not lead to absence. Working ability is seen as a result of both capacity, knowledge, skills and adjustment latitude. The employee’s skill and knowledge is thought to affect the effort they have to put in at work, and adjustment latitude is the individual’s possibility to adjust their work according to their own health. Working ability is also affected by an individual’s motivation, which the theory divides into attendance incentives and absence incentives. The incentives can be subdivided into incentives that are based on external expectations (ought to), and incentives based on internal motivation (want to) (Johansson, 2007). The theoretical approach of the IFM to the study of sickness absence is interesting because it theorizes the link between illness and sickness absence, recognising that there is not a one-to-one relationship between the two. In the study of organizational change, it is helpful to recognise that organizational change may not only affect sickness absence through disease or increasing demands, but also through motivation.
Furthermore, organizational change might not have the same effect on all employees, as knowledge, skills and adjustment latitude are unequally distributed amongst employees.

A phenomenon related to sickness absence is that of sickness presenteeism. The concept denotes employees attending work despite feeling that they should be on sick leave (Aronsson et al., 2000). A premise of the sickness presenteeism literature is that short-term sickness absence can be seen as a coping mechanism providing employees with an opportunity to regulate their workload when needed. Not a topic of study in this dissertation, sickness presenteeism may also be a consequence of internal reorganization if it makes employees feel obligated to attend work whilst feeling ill.

**Disability retirement**

Being the recipient of a disability pension can be understood as a social role that a person with reduced working capacity can hold in society. This social role grants the person a right not to work, and to be financially compensated for the loss of working capacity. To hold this role, the working ability of the person needs to be reduced by at least 50% by medical causes certified by a physician. All residents aged 18 to 66 who have been a member of the National Insurance Scheme for at least three consecutive years before the onset of disease are eligible for the disability pension programme. Entering disability retirement is usually a long process starting with one year of physician-certified sickness absence. Before the disability pension is granted, the Norwegian Labour and Welfare Administration (NAV) investigates the possibility of work rehabilitation. For those who entered disability retirement in 2005, the process took on average 2.5 years from the onset of disease until the pension was granted (NOU 2007:4, 2007). The disability benefit consists of a flat rate and an earnings-based component in addition to means-tested supplements to beneficiaries with a dependent spouse and children. The replacement rate is within the 60% to 70% found in many countries (OECD, 2003).

Disability retirement involves aspects of both disease (a physician-certified medical cause), illness (the individual’s perceived disability) and sickness (NAV’s evaluation of working ability). In a longitudinal study of disability retirement after a factory closure, Westin (1990) found that increased strain in daily life could lead to higher levels of perceived disability by both the recipient and the physician, even when the individual’s health state was unchanged. Research has shown that low socio-economic status, low educational attainment, low control and high demands at work are all determinants of disability retirement, even when controlled for long-term illness, self-rated health and health behaviour (Krokstad et al., 2002). A recent study of data from 1995 to 2008 showed that educational inequalities in disability retirement
were not fully explained by long-term illness, occupational, psychosocial and behavioural factors (Nilsen et al., 2012). The above studies show that both characteristics of work and socio-economic status affect the entry into the social role of being a disability recipient. This happens regardless of the individual’s subjective feelings of illness.

The combination of push and pull factors is widely used to explain the transition from work to retirement (De Preter et al., 2013; Radl, 2013). This theoretical approach is also relevant in the study of disability retirement. Rational choice theory focuses on the factors pulling employees out of the workforce. Employees are seen as rational actors, acting in a cost-effective way. The employee makes the decision to stop working by weighing the value of free time against the cost/benefit of paid employment. In cases of worsening health, the value of leisure time and the costs of working both increase. This increases the individual’s risk of withdrawing from the labour market. Relatively generous disability pensions is also a pull factor, placing a tax on work that increases the individual’s motivation to retire (Schils, 2008).

Sociologists have focused more on structural factors pushing employees out of the labour market. Applying for a disability pension is a decision that the individual employee makes under certain conditions; illness, unemployment and attitudes towards working with disabilities are all elements affecting the employee’s decision. Physical health status has a strong influence on early labour market exit (De Preter et al., 2013). In addition to limiting the physical or psychological capabilities of the employee, illness has a wider social and cultural significance. Thus, to continue working with long-term illness is not just a matter of adjusting the work tasks and physical environment, but may also be highly influenced by the employer’s, co-workers’ and employee’s attitudes towards illness (Pinder, 1995). In situations where the organization is looking to reduce or reorganize the workforce, employers might see disability retirement as a legitimate way for less efficient employees to withdraw from the labour market. Employees with a diminished health state may also prefer the option of applying for a disability pension to an uncertain job situation in the reorganized organization. Disability retirement might be perceived as an unofficial form of early retirement (Buchholtz et al., 2006) and has been called “an unemployment problem in disguise” (Bratsberg et al., 2010). Structures at the workplace and in society might therefore facilitate the workforce exclusion of employees with a marginal health state.
**Turnover**

Like sickness absence and disability retirement, turnover depends on several factors both internal and external to the individual employee. For the employing organization, turnover represents both costs and possibilities. The temporary loss of labour, costs of hiring and training new personnel and loss of continuity are examples of costs. On the other side, some degree of turnover is beneficial because it allows employers to replace higher paid workers with lower paid workers and to renew the workforce in terms of qualifications and demographic characteristics.

There is a wealth of research trying to find the best predictor for turnover (Griffeth et al., 2000). Turnover is generally understood as a process that unfolds over time (Lee et al., 1999). The best predictors of actual turnover are closely connected to the decision of quitting – job satisfaction, organizational commitment, job search behaviour and intentions to quit. Other predictors are characteristics of the working environment such as job content and stress and the existence of alternative job opportunities (Griffeth et al., 2000).

In trying to explain the process of quitting, Lee et al. (1999) propose that ‘shocks’ at work have a prominent role in triggering thoughts of exiting the organization. The shocks can be negative, neutral or positive events that prompt the individual employee’s thinking about their job and their workplace. Organizational changes and the accompanying events are likely to be experienced as such ‘shocks’ by the individual employees (Morrell et al., 2004). Earlier research has shown a link between organizational change and turnover. Turnover has been found to increase following the merger of two state hospitals in New York (Jick, 1979) and following the implementation of a patient-centred medical home model of care in the US Veteran Health Association (Sylling et al., 2014).

Not only acting as a ‘shock’ that triggers thoughts of leaving, organizational change might also affect the employees’ working environment. According to Hirschman (1970), ‘exit’, ‘voice’ and ‘loyalty’ are responses available to employees facing unfavourable changes at their workplace. ‘Exit’ entails leaving the organization, whilst ‘voice’ is defined as “any attempt at all to change, rather than to escape from, an objectionable state of affairs” (Hirschman, 1970: 30). Hirschman introduces the concept of ‘loyalty’ as a mediator in the choice between exit and voice. The function of loyalty is that it can limit the tendency of employees to exit when they are not satisfied. Loyalty gives them a reason to use voice to remedy the situation, as exit is less attractive the deeper their feeling of loyalty towards their employer or organization runs.
(Hirschman, 1970). Loyalty has also been interpreted as a separate response option; employees with a strong attachment to the organization may choose to be loyal and simply abide by the management’s decisions without actively showing their discontentment. Along with neglect, avoidance and disregardful behaviour, this has been referred to as passive response option (Berntson et al., 2010). In this framework, turnover, or exit, represents an active way for employees to respond to an unfavourable situation at their workplace.

From a health perspective, turnover can be seen as a way to actively cope with a stressful or unhealthy situation by withdrawing from it. Sickness absence can also be a way to withdraw from unfavourable situations at work, in which case it can be classified as exit. However, the employee is still employed, so sickness absence can best be understood as a partial or emerging exit (Mastekaasa, 2013). Josephson et al. (2008) found that turnover and long-term sickness absence were influenced by the same factors in a three-year prospective study of nurses. Working in geriatric care, experiencing social exclusion in the workplace, negative effects of organizational changes and poor self-rated health influenced both outcomes. Although the same factors influenced both sickness absence and turnover, there was very little overlap between those who entered long-term sickness absence and those who changed employers during the study period. The authors argue that sickness absence and turnover are separate ways to actively cope with unhealthy working conditions. Nordström et al. (2014) found that in Sweden (where there was no maximum duration of sickness absence compensation), employees with more than 180 days of sickness absence who changed jobs were more likely to be employed after 4 years than those who did not change jobs. The study suggests that job change can be an effective strategy in vocational rehabilitation. This view is also represented in the Norwegian law on disability retirement. Before granting a disability pension, case workers at the Norwegian Labour and Welfare Administration (NAV) are first required to assess whether work or medical rehabilitation are viable options.

Turnover is not a coping mechanism that is equally available to everyone. As mentioned earlier, the existence of alternative job options predicts turnover (Griffeth et al., 2000). Skilled individuals will have an easier time finding another job than unskilled individuals. Furthermore, personal resources such as health play a part in how people appraise and cope with stressful situations. Individuals’ ability to exercise agency, to “actively construct their lives in order to eliminate or dampen stressors” (Thoits, 2006: 316-317), is unequally distributed. Thoits (2006) describes how people with good mental health actively confront difficulties and stressful situations. Selecting oneself out of a strain-inducing job is an effective mechanism to alleviate
stress. However, applying for another job requires confidence and belief in one’s own capacities along with other personal resources like self-esteem, mastery and optimism, all associated with good mental health (Thoits, 2006). Employees with health problems have shown to be less likely to change employers than healthy employees (Pelkowski and Berger, 2003). Turnover as a response to unhealthy working conditions is therefore likely to be contingent on the employee’s health.

**Why does organizational change influence employees’ health and well-being?**

The consequences of organizational change for employees are predominantly thought to be negative, disrupting the psychosocial working environment and creating a tougher working life with both increased demands and increased insecurity (e.g. Jick, 1979). This dissertation, too, focusses on predominantly negative outcomes – sickness absence, disability retirement and turnover. It is important to keep in mind that the consequences of organizational changes may also be positive. Smaller work groups with more autonomy, involving upskilling and increased social support are positive consequences of organizational changes (Nilsson et al., 2009). Leaving the salutogenic approach to future studies, this section will summarise theories and previous research on the effect of organizational change on employees’ health and well-being.

The psychological and management literature on employee reactions to organizational change is reviewed by Oreg et al. (2011). They draw a distinction between explicit reactions to, and consequences of, organizational changes. Turnover, sickness absence and disability retirement are all examples of indirect consequences of organizational changes. They are mediated by the direct consequences that organizational changes have for the employees, and the employees’ affective, cognitive and behavioural reactions to these. This dissertation did not have available data on the direct change consequences for the employees or their reactions to the changes. This section presents theories modelling the pathways from organizational change to sickness absence, disability retirement and turnover. A prominent approach in research on organizational change effects on employee sickness focuses on the role of stress in causing ill health. Stress theories, which link characteristics of the working environment to chronic stress affecting employees’ health, will therefore be given attention in the following section. Furthermore, as discussed earlier, diminished health is not the only pathway to sickness. I will therefore also present theories on how organizational changes may increase the efforts required at work, affecting the balance between health and job demands. Turnover is the response option that does not necessarily have a health component. Changes in job quality, demands and job
insecurity might affect well-being without affecting health, for instance through lowering job satisfaction.

**How people experience and respond to change**

All transitions, regardless of whether they are perceived as positive or negative, can be stressful. The effort required to adjust to the transitions is linked to the onset of illness (Holmes and Rahe, 1967). Thus, any organizational change may cause stress in individual workers due to the adaptive or coping behaviour that is required to come to terms with the change. Even suggesting changes might cause stress in the work organization and for individual employees. Carnall (1986) analyses how organizational change affects the social order and collective relations within the organization. He argues that even changes that are desired by some members of an organization, without ever being introduced, can disturb the social order in the organization.

The stress related to a transition itself is temporary. However, the change may lead to a working environment that is more stressful and unhealthy both in a limited period surrounding the change and in the long run. Theories on how the working environment affects stress will be presented in the next section. For now, I will stay on the subject of how people deal with change. The theory of adaptation explains how individuals tend to adapt to changed circumstances in life, reducing the impact of the changes on health and well-being over time (Diener et al., 2006). This has been seen in various life transitions, such as marriage dissolution (Meadows et al., 2008). Following adaptation theory, even if working conditions do deteriorate following a merger and remain harmful, employees can adapt to the new situation after a while, reducing any negative or positive health effects of the changes.

In an important sociological contribution to stress research, Thoits (2006) argues that the ability of individuals to cope with stressful circumstances varies. Self-esteem, mastery and perceived support are psychosocial resources that allow individuals to take active control over the circumstances that shape their lives. Thoits argues that individuals are both socially- and self-selected in and out of stressful circumstances. The ability to exercise agency has been shown to be unequally distributed according to socio-economic status. This means that in addition to inequalities in the extent to which individuals find themselves in stressful circumstances, inequalities in agency offer them varying possibilities of coping with the situation in order to reduce its effect on health (Thoits, 2006).
Job quality and stress

There is a long-standing sociological tradition of concern about how the quality of the job affects employees’ self-development, well-being and health. Moreover, there is a debate in the literature regarding how the changes we see in working life are affecting the current and future quality of jobs. Characteristics of the work tasks and job security are deemed two crucial factors in assessing job quality (Gallie, 2003). Organizational changes are likely to affect several aspects of an employee’s work. Both neo-Marxist theories warning about the deskilling of work and neo-liberal theories predicting skill-upgrading acknowledge the importance of task discretion for the quality of jobs. Task discretion is associated with employee motivation, job satisfaction and psychological well-being (Gallie, 2012).

Task discretion is one of the pillars in the influential Demand-Control (DC) model proposed by Karasek and Theorell (1981). The model describes how an unfavourable working environment leads to chronic stress in the individual. The physiological response to stress protects the body in the short term, however, in the long run, the wear and tear of the stress responses on the body cause disease (McEwen 1998). The main theory in the DC model is that the combination of high demands at work and lacking the freedom to make decisions (control) in the face of these demands results in physical strain caused by constant stress. A low level of control manifests itself in two ways; through lack of decision latitude and through low level of skill utilization. High demand jobs are characterized by being hectic and psychologically demanding. Low levels of control and high levels of demands are associated with strain. The highest risk for strain comes from work characterized by both low control and high demands (Karasek et al., 1981: 694-695). If organizational changes lead to a working environment dominated by increased demands or decreased control, they would cause increased strain in employees.

Siegrist’s (1995) Effort-Reward Imbalance theory (ERI) also sees the work environment as a potential source of unhealthy stress. The theoretical model states that an imbalance of efforts and rewards in the employment relation is emotionally distressing, with chronic imbalance leading to detrimental health effects caused by stress. High efforts can be rooted in pressure from within the individual or pressure from outside. When the high efforts are directed from outside, for example by the demands of the job, the efforts are extrinsic. Intrinsic efforts are demands that the employee puts on themselves; one example is overinvestment in the job. Rewards may be money, esteem and status control like job security and promotion prospects (Siegrist, 1995). In line with the ERI theory, organizational changes increasing the demands on
employees or reducing the rewards, for instance by increasing job insecurity, will increase employee strain.

Researchers behind a newer model, the Job Demands-Resources (JD-R) model, criticise the DC and ERI models of being too simple and static (Bakker and Demerouti, 2007). They question the prominence of task discretion or rewards in each of the former models and argue that different occupations have different specific risk factors and resources associated with job stress. The researchers propose a model where the specific risk factors for job stress can be classified in two general categories – job demands and job resources. Job demands include physical, psychological, social or organizational aspects of work that require effort and skill and therefore entail physiological or psychological costs for the employee. Job rewards include corresponding aspects of the job which are used to achieve work goals, reduce demands and stimulate personal growth, learning and development. The resources are seen as important in their own right, not only as tools to tackle demands. Researchers applying the model should include the demand characteristics and resources that are unique to the organization or occupation under study. Incorporated in the model are two different psychological processes. The first, is the ‘health impairment process’, where job demands exhaust employee’s mental and physical resources, causing burnout. The second, is the ‘motivational process’ where job resources are seen as increasing work engagement and performance. The two processes are also thought to interact, so that high resources protect against the ill-effects of high demands (Bakker and Demerouti, 2007). Continued organizational change might affect both the demands and resource processes, causing ‘change fatigue’ (Sylling et al., 2014). In a study of physicians’ and nurses’ reactions to the Norwegian hospital reforms, Fjeldbraaten (2010) found that the institutionalized goal of higher productivity conflicted with professional logics and led to a feeling of resignation amongst employees (Fjeldbraaten, 2010).

Of the three stress models, the DC model has been the most widely used to assess the effect of workplace changes on employees’ health. A systematic review of the health effects of task restructuring with reference to the DC model indicates that changes that decreased control and increased demand had adverse health effects (Bambrat et al., 2007). Analyses of Statistics Norway’s living conditions survey in 2003 show that 45% of the employees in the public sector had experienced extensive reorganizations during the last two years. Those who had experienced reorganizations reported an increase in work demands, less time to do their tasks and shorter deadlines than those who had not experienced reorganizations. They also reported greater demands on them to master new tasks (Trygstad, 2006). Other analyses of the same data
show that reorganizations and downsizing were both associated with higher demands and job insecurity. Only reorganization was associated with work-related health problems (Østhus, 2007). Studies of downsizing and restructuring in the health sector have also supported these findings to some extent. Work reorganization and downsizing have been found to be associated with higher demands (Bourbonnais et al., 2005a), whilst the association with control was unclear (Bourbonnais et al., 2005a; Bourbonnais et al., 2005b; Petterson et al., 2005).

Although the stress theories mainly focus on stress-induced diseases as causing sickness absence, other pathways from stress to health-related benefits are also plausible. In situations of high stress, entering sickness absence may be a coping mechanism to avoid disease. As discussed earlier, sickness absence and disability retirement are not a pure reflection of an individual’s disease and illness, but depend on the social and workplace demands put on the individual. If organizational changes increase demands at a workplace, employees whose health resources previously matched the job requirements may find that their current health state is no longer adequate. Continuous coverage is seen as a moral obligation of modern Western hospitals (Zerubavel, 1979: 41). Hospital services cannot be put on hold during the process of organizational change. Thus, organizational change requires efforts in addition to those put in during regular service. Coupled with the goal of increased efficiency, organizational changes are likely to increase the demands put on employees. This has for instance been shown in a study of the process of planning and moving of a Norwegian hospital to a new building. The process also involved cost reduction, which meant that additional tasks associated with the move were to be solved on top of the day-to-day care (Berg, 2012). Following a process of organizational change in a large Swedish teaching hospital, less time to plan work was associated with increases in long-term sickness absence (Petterson et al., 2005).

**Job insecurity**

The transitions inherent in organizational change are likely to affect employees’ feeling of job insecurity. Job insecurity is defined as “perceived powerlessness to maintain desired continuity in a threatened job situation” (Greenhalgh and Rosenblatt, 1984: 438). Job insecurity may come from the fear of losing one’s job, but also from the fear of losing valued job features like career progression, status/self esteem, autonomy, resources and community. The consequences can be reduced work effort, propensity to leave and resistance to change (Greenhalgh and Rosenblatt, 1984). Job insecurity is associated with various measures of psychological ill health, self-reported physical health, sickness absence and workplace injuries and accidents (Ferrie et al.,
There is a debate amongst academics who claim that increased job insecurity is a devastating feature of modern working life (Sennett, 1998; Standing, 2014), and those who claim that there is no evidence of increased job insecurity now compared to three decades ago (Fevre, 2007; Green, 2006). Gallie et al. (2016) advocate the usefulness of separating between job tenure insecurity and job status insecurity. The former refers to the fear of losing one’s job, whilst the latter refers to the fear of losing valued job features. Following social identity theory, membership in social groups forms the foundation of an individual’s self-definition. People partly define themselves in relation to their work organization and they are inclined to resist changes that compromise the distinctiveness of their social group. For example, regardless of the level of change following a merger, all employees become members of a new organization. This change may threaten their sense of self (Colman, 2011).

The increased rate of change embedded in modern work-life organization (Cappelli et al., 1997) might entail an increase in status insecurity. Gallie et al. (2016) find that in Britain, work reorganization is significantly associated with job status insecurity, whilst workforce reductions are associated with job tenure insecurity. Uncertainty and ambiguity as a significant source of stress during organizational change was also uncovered in a qualitative investigation. The researchers studied employee reactions to a radical change programme in a department of the British government (Robinson and Griffiths, 2005). The link between uncertainty and distress during workplace reorganization in the British public sector is also shown by Pollard (2001). Pollard finds that job status insecurity and role ambiguity are associated with reduced mental well-being and increases in systolic blood pressure (Pollard, 2001). The increase in distress is likely to affect health and increase sickness absence. However, both contractual and subjective job insecurity has been associated with sickness presenteeism amongst healthy staff in the Finnish public sector (Heponiemi et al., 2010). Thus, the effects of job insecurity on sickness behaviour during organizational change may go both ways: increasing the likelihood of both absence and presence.

Carnall (1986) analyses reaction to change from a power perspective, assuming that organizations are comprised of distinct groups of people differentiated according to power, status, rewards and deprivations. These groups have different and potentially conflicting interests. Carnall (1986) assumes that organizational change affects the social order and collective relations within the organization. In instances where changes or proposed changes
are experienced as negative by certain groups, a range of possible behavioural responses are elicited. The responses include both passive and active forms, from actively opposing the changes to passively accepting them. Regarding changes in the hospital sector, competing logics between management and professional logic might influence reactions to and the implementation of changes (Martinussen and Magnussen, 2011). In a qualitative investigation into the competing logics of professionals and the institutionalized goals of increased productivity and improved quality at a Norwegian hospital, Fjeldbraaten (2010) describes how both nurses and physicians were under strong institutional pressure to abide by the organizational changes. Whilst improved quality is a goal that complies with the professional logics of both physicians and nurses, improved productivity is not. The nurses seemed to reluctantly conform to the changes, even though the changes meant less time spent on the core nursing tasks of care for each patient. Physicians, however, to a greater degree translated the demand for productivity to comply with the medical professional logic. At the same time they resisted changes that were incompatible with their professional standards. One of the explanations proposed by Fjeldbraaten (2010) for the differing responses was that the physicians have a stronger profession, continually doing ‘institutional work’ to preserve the autonomy and power the profession holds in the hospitals. The status of an employee’s profession in an organization may thus affect how organizational change is appraised and how the employees’ job quality is affected.

Social inequalities in work and health
The labour market is structured according to skills, job quality and work-related risk factors. The lower educated have worse health (Bartley, 2004; Marmot and Wilkinson, 2006), worse working conditions (Siegrist and Theorell, 2006) and a weaker labour market attachment (McIntosh, 2004; OECD, 2013). There is also social inequality in how health affects labour market participation. High education increases the chances of a person continuing to work despite having an illness (Bartley and Owen, 1996; Van der Wel et al., 2010).

The social inequality in both health, working conditions and the uptake of health-related benefits makes it likely that there are also differences in the effect of organizational changes on sickness. Organizational changes increasing demands and lowering control is likely to have the most detrimental effects on those employees who already have the worst working conditions or the worst health. Furthermore, the ability to cope with stressors is unequally distributed according to social resources (Thoits, 2006). Any changes in working conditions increasing strain during organizational changes is likely to primarily affect those individuals who are
working close to their illness threshold. On the same note, increases in stress causing ill health might have a bigger effect on individuals with lower decision latitude at work. These employees will not be able to adjust their work effort required in order to accommodate decreasing health. Therefore, entry into sickness absence or disability retirement is more likely for these employees.

There is likely to be variations in how organizational changes affect the working environment and how they are perceived by the employees depending on their position in the organization. Employees at higher levels in the organization have more control over the change processes than lower level employees, and have been found to report a higher level of employee adjustment during change. However, managers might also report more change stress due to responsibility (Martin et al., 2006). On the outcome side, the desirability, relative benefits of, and access to the different behavioural responses might also vary according to socio-economic status. As argued earlier, turnover is most likely more available to healthy employees with alternatives on the labour market, whilst disability retirement is more available to employees with lower education (Nilsen et al., 2012).

DATA AND METHODS

Presentation of data

The data analysed in the study consists of individual level register data collected by the Norwegian Labour and Welfare Administration (NAV) and Statistics Norway (SSB); a biannual survey on the internal organisation of hospitals (INTORG) answered by hospital management; and records on mergers derived from the National Patient Register (NPR).

The register data includes information on all employees of the Norwegian hospital sector (NACE Rev.1.1 code 85.11) in the third week of November each year from 2000 to 2008. The data come from administrative records that are collected by either the Norwegian Labour and Welfare Administration (NAV) or Statistics Norway (SSB). They include demographic information, information about employment, education and welfare receipt including physician-certified long-term sickness absence (>16 days) and receipt of a disability pension. Unique person and organization identification numbers make it possible to link individual information from several different administrative registers and to link employees to their workplace. SSB merged the data accessible to this project after the Regional Committees for Medical and Health Research Ethics (REK) and the Norwegian Social Science Data Services
(NSD) had approved the study. The unique identification numbers were replaced with sequential numbers.

The INTORG biannual surveys have tracked the internal organization of Norwegian hospitals since 1999 (the survey for 1999 was answered retrospectively in 2001). See Kjekshus and Bernstrøm (2010) for details about the survey. All public hospitals in Norway have a surgical and a medical field of operation (division), either organized in distinct units or sharing some units, for example hospital beds. The hospitals were asked to answer one questionnaire per division. Usually the department manager answered the questionnaire. In cases where there were more than two divisions at a hospital, or where one division was situated at more than one location, the hospitals were asked to answer one questionnaire per division and location. Questions about internal organizational changes were added to the survey in 2005. Article 1 in this dissertation uses data from the 2005 and 2007 surveys. In 2005, 52 of 63 (83%) public hospitals and in 2007, 52 of 57 (91%) answered these questions. Of these hospitals, 48 answered the questions in both 2005 and 2007. Most hospitals returned one questionnaire each for the medical and surgical operations (60% and 81% in 2005 and 2007 respectively), some returned only one questionnaire (30% and 15% resp.) and a few returned between three and six questionnaires (4% and 13% resp.). The analysis includes register data on 68,630 employees.

Hospitals report annually to the Norwegian Patient Register (NPR). Hospitals that are undergoing a merger report jointly in January the year following the merger. The data on hospital mergers were derived from this reporting. Articles 2 and 3 analyse the effect of mergers.

**Strengths and weaknesses of the data**

The register dataset includes detailed information about each employee’s sickness absence, disability retirement and turnover. Due to economic reimbursements for long-term sickness absence spells and disability pensions, as well as employers mandatory reporting to the employment registry, the registers are regarded as complete and objective. A limitation of the data regarding sickness absence is that only physician-certified sickness absence reimbursed by the state is included. Any effects on self-certified or short-term absence are therefore not shown in this dissertation. On the positive side, objective measures have the advantage of not being subjected to recall bias or any other types of under- or over-reporting. There is also no risk of non-response bias, as all employees are included.
The data on organizational changes were collected at the department or hospital level. This approach secures information that is unrelated to each individual employees’ affective state. A significant weakness of this data is that it was only possible to link information about organizational change at the hospital level to each employee. I have no data about whether, and to what extent each individual employee was affected by the changes. Also, the data do not have any information about several of the important intermediary variables that are proposed to be affected by organizational changes. The quality of jobs, working environment, employees’ reactions to the changes, such as job insecurity and stress responses, are not seen in the data. Thus I am not able to provide evidence supporting either of the proposed mechanisms leading from organizational change to sickness absence, disability retirement and turnover.

By combining two different sources for analysing the effect of workplace changes on individual outcomes, the analyses avoid ‘same-source bias’. Single-source, self-reported cross-sectional data has been dominant in earlier research on change recipients’ reactions to change (Oreg et al., 2011). In these studies, common variance between the variables can be explained by the employees’ affective state when answering the questionnaire or by the employees’ thoughts about how things are related. An unhappy employee might report bad health and a high degree of organizational change, possibly exaggerating both. Such biases are avoided in the analyses in this dissertation.

**Fixed-effects analyses**

The analyses in the articles rely on regression-based approaches: fixed-effects Poisson regression (Article 1), difference-in-differences (DiD) with hospital fixed effects using logistic regression (Article 2), and discrete-time survival analysis using logistic regression, also including hospital fixed effects (Article 3). The methods used are described in detail in each of the articles. The methods are quasi-experimental, a reference to the ideal of the classic experiment. The aim is to find the effects of an independent variable on the dependent outcome variable. In a classic experiment, the researcher controls all attributes of interest and the main independent variable is randomly assigned to the test subjects (Angrist and Pischke, 2009). This is seldom possible in real life; the experience of hospital mergers or internal reorganizations are not randomly assigned to employees. Mimicking the approach of the classic experiment, statistical methods are used to control for possible mediating variables. The panel structure of the data allows for fixed effects (FE) approaches to factor out all time-constant characteristics of individuals (article 1) and hospitals (articles 1, 2 and 3) (Angrist and Pischke, 2009: 221).
In the first article, I use individual FE analyses to analyse whether changes in the number of organizational changes at a hospital from 2005 to 2007 was correlated with changes in the number of sickness absence days for employees of that hospital. Interaction terms between organizational change and educational attainment were included to test for differences in the effect between educational categories. Only looking at changes within each individual from one year to the next removes possible selection effects from the analysis. The results will not be affected by, for instance, the need of hospitals with a high degree of sickness absence to reorganize. Thus, I can be more confident that it is the effect of organizational changes on sickness absence that is measured, and not vice versa. However, the approach does not control for time-varying differences between hospitals. There may have been other changes at the hospitals, of which we are unaware, that affected both reorganization and sickness absence. It is only possible to estimate the coefficients of variables that vary over time using the FE approach. Another disadvantage of the FE Poisson model is that only employees who have registered sickness absence in at least one of the years are included in the analyses (Cameron and Trivedi, 2005: 805-806). The Random Effects (RE) estimator relies on information on all employees included in the analyses, and is thus not susceptible to these two conditions. However, it does not control for selection, so the RE estimators may be biased. As a robustness check, I ran both FE and RE analyses. The results were similar in terms of statistical significance and size, although the FE effects were somewhat weaker.

In articles 2 and 3 I include hospital FE. In article 2, the aim is to analyse whether mergers lead to a higher risk of disability retirement amongst employees. I use a DiD approach to estimate changes in the risk of disability retirement associated with mergers. Non-merging hospitals were few and distinct from hospitals that did merge, making them an unsuitable control group. Instead, I exploit the variation in timing of the mergers between hospitals. Hospital dummy variables were included in the model to account for systematic differences between the hospitals that merge and those that did not. Calendar year dummy variables controlled for variations in disability retirement between years that were common to all hospitals. Individual level variables controlled for variation in the hospitals’ staff between the years. In effect, the FE approach means that each hospital in the year or years before the merger is its own control (Angrist and Pischke, 2009: 233). Interaction terms between merger-year and education were included to investigate the effects of mergers in disability retirement amongst employees with tertiary or higher and secondary or lower education. Applying for and being granted a disability pension takes years, and it is likely that any effects of a merger on disability retirement would take some
years to appear. I compared the rate of disability pension uptake in each year of the merger process to one or more years before the merger at the same hospital. This approach allowed for an analysis of the timing of the effects of the merger. I cannot rule out the possibility that the coefficients of the merger variables were affected by other changes that coincided with the mergers. Also, it is not possible to say exactly which aspects of the mergers affected disability retirement.

In article 3 I also include hospital fixed effects in a discrete-time survival analysis of mergers and turnover. The goal is to investigate when during the merger process the risk of turnover was the greatest. I follow each employee from their first registered employment spell at any of the included hospitals until they leave their organization or until the end of 2006. I estimate destination-specific rates directly (Petersen, 1991) using multinomial logistic regression (Allison, 1982) for transitions to another job within the hospital sector, to other sectors or out of work. The analysis estimates the probability of turnover in a given year, conditional on it not having happened before. The hospital FE approach accounted for systematic time-constant differences in turnover between hospitals.

**Timing the effects of organizational change**

Organizational changes do not just happen, there is a temporal aspect to them (By, 2005: 378). The process of implementing planned organizational changes, or changes in the environment affecting the organizations, start at one time and stop at another, even though it might be difficult to say exactly when these points in time are.

A challenge in the analysis of the possible effects of mergers was determining the timing of the effects. In article 1, the independent variable was the number of internal organizational changes that occurred at each hospital in a given time period and the dependent variable was the days of registered sickness absence in the same year. The analysis says something about how change itself affects sickness absence. Regarding mergers and disability retirement, it was more challenging to time the effects of the change. The mergers were effective from a certain date, however, the merger process did not happen at that specific date for the employees concerned. The merger was announced at another point in time, and there may even have been rumours of the event before the announcement. Maybe there was a struggle surrounding the decision to merge both before and after the merger was effectuated. Moreover, the actual changes that the mergers entailed may have happened close in time to the official merger date, or over the course
of a few years following the merger. Furthermore, as mentioned above, being granted a disability pension is a process that takes a few years.

Anticipation effects are effects that result from actions taken by employees in anticipation of the changes that are to come. For instance, it is likely that employees think about their job in the organization before a merger, and possibly act according to how they think the changes will affect their job. The data available to this study included a limited number of years. As most mergers were registered by 1 January 2002, and thus happened at some point in 2001, they only include one pre-merger year. There is a risk that increases in turnover in anticipation of upcoming mergers influenced the base year, limiting the estimated effects. Most mergers were a result of the Hospital Enterprise Reform passed in parliament in June 2001 following a very swift political process initiated one year earlier (Herfindal, 2008). The proposition from the Norwegian Ministry of Health and Social Affairs was sent to various consultative bodies in January 2001. That was also when the reform reached public debate and opposition to the reform started to mobilize (Herfindal, 2008: 84). It is thus unlikely that employees knew about the mergers or were affected by unrest regarding the proposed reform in 2000.

The inclusion of a merger year dummy set in articles 2 and 3 allows for the analysis of when during the merger process the effects on disability retirement and turnover were the greatest. Measuring the effects of mergers over several years also allows for some investigation into the question of whether the effects of organizational changes were short or long term. A short-term effect would most likely be attributable to reactions to the transition or short-term changes to the working environment. Effects that are visible over several years could be attributable to permanent changes to job quality. At the same time, it is important to keep in mind that the distinction is not clear cut, as a higher frequency of changes might be a permanent feature of modern working life (Cappelli et al., 1997). For example, it has been argued that mergers are typically followed by an increasing number of other internal organizational changes (Kjekshus et al., 2014).

**SUMMARY OF THE ARTICLES**

**Article 1: Reorganization increases long-term sickness absence at all levels of hospital staff: panel data analysis of employees of Norwegian public hospitals**

Author: Mari Holm Ingelsrud

Published in BMC Health Services Research 2014, 14:411. DOI: 10.1186/1472-6963-14-411
The purpose of this article is to investigate the effects of reorganization on long-term sickness absence amongst different levels of hospital staff. I use panel data on employees of the hospitals in 2005 and 2007 who were employed in the same job the whole year. The dependent variable consists of register data on each employee’s number of physician-certified long-term sickness absence days. Surveys on organizational change, answered by hospital administration staff, measures five types of organizational change: merging units, splitting up units, creating new units, shutting down units and reallocation of employees. The average number of changes within each hospital division is linked to individual-level data based on place of occupation.

One motivation for the article is the primary focus on downsizing in earlier research. Earlier research is inconclusive on the effects of downsizing on health, sickness absence and morbidity, and there is little research on the effects of other types of organizational change. Another motivation is investigating whether the effects of reorganization vary between employees at different levels. Since employees at higher levels of the organization are less ill, and generally have better psychosocial working conditions than lower grade employees, its likely that they are less affected by organizational changes. However, as lower grade employees are less involved in the planning and execution of the organizational changes, they are likely to be less subjected to the added workload of administering the organizational changes whilst at the same time fulfilling regular duties.

The analyses show that employees who experienced an increase in organizational changes from 2005 to 2007, also had an increase in number of sickness absence days. There are few significant differences between employees at different levels, indicating that employees at all levels of the hospitals are affected by the organizational changes.

**Article 2: Disability retirement and public sector reorganization: Hospital mergers in Norway**

Author: Mari Holm Ingelsrud

Published in Acta Sociologica, 2016, Vol. 59(1) 35–50. DOI: 10.1177/0001699315611191

In this article, I investigate the effect of mergers on employees’ risk of disability retirement. I focus on whether the effect on disability entry differs according to employees’ educational attainment. I use register data on all employees of the hospitals from 2000 to 2006, linked to information about hospital mergers from the National Patient Register. By using a differences-
in-differences approach with hospital fixed effects, I investigate when during the merger process the risk of disability retirement is the greatest.

Mergers are executed to increase the efficiency of the new organization through economy of scale effects, reduced duplication of functions and a belief that a higher volume of activities increases the quality of the services. There are different theories on why mergers might increase the risk of disability retirement. The stress theories focus on changed psychosocial working conditions and increased job insecurity following mergers. Others focus on the exclusion of inefficient employees. Different explanations leave different expectations as to when during the merger process disability retirement would be affected. Increased work demands and job insecurity may be enduring characteristics of the merged organization. A merger may also entail lasting negative consequences for the employees in the form of loss of status or position. If so, we expect the risk of disability retirement to increase in relation to the merger, and remain higher in the post-merger organization than in the pre-merger organization. On the other hand, the effects of a merger can be short term. Increases in job insecurity and working demands during the merger may fall to normal levels once it is completed. Selection out of the merging organization may also increase the risk of disability retirement in the short term if inefficient employees apply for a disability pension as a form of ‘grey’ early retirement.

The analyses show that the risk of disability retirement is significantly higher only in the second year after the merger. Predicted probabilities show that the effect is only significant for the lowest educated employees, with no significant effect for employees with tertiary education. The results indicate that the effect of mergers on disability retirement is short term. This does not support the idea of a high-strain post-merger working environment. Rather, one possible explanation is that short-term increases in job demands at the time of the merger lead some employees to become disabled. Another possible explanation is that the disability pension is used by managers to accomplish staff reductions or by employees as a form of ‘grey’ early retirement.

**Article 3: Turnover during hospital mergers in Norway: Neither healthy nor unhealthy employees leave the hospital sector**

Author: Mari Holm Ingelsrud

Under review at Nordic Journal of Working Life Studies
The dissertation’s third article analyses the relationship between hospital mergers and turnover. The analyses investigate whether employees’ health affects the relationship between mergers and turnover to three destinations – within the hospital sector, to other sectors and out of work. Register data on all employees who were employed in the hospital sector is linked to information about hospital mergers from the National Patient Register. Discrete-time survival analysis models the likelihood of turnover in each year of the merger process, given no turnover up to that point.

Previous research has documented increased strain on employees following mergers, and also increased voluntary turnover. Who leaves and which destination they turnover to are important questions, yet what we know about these aspects of the turnover that occurs following mergers is limited. According to theories about job-to-job mobility and health, it is likely that the healthiest employees are the most mobile and therefore most likely to turnover to alternative jobs. Employees with poor health on the other hand, are the most likely to exit working life as a response to deteriorating working conditions.

The analyses show that turnover within the hospital sector increased during the merger process, significantly so in the second year following the mergers. This was the same for employees of both poor and good health. Turnover to other sectors or out of work did not increase compared to the pre-merger years, and there were no pronounced differences between employees with good and poor health in this regard. The exception is a significantly lower turnover to other sectors amongst employees with poor health in the merger year compared to years before the merger. The results most likely show turnover that was directly related to the moving or amalgamation of services following the mergers, and tell us that these changes were first executed a couple of years after the hospitals were formally merged. The lack of unwanted turnover to other sectors and out of work following Norwegian hospital mergers can be attributed to the institution of employee participation during workplace reorganization, the high demand for labour in the hospital sector and the sector’s near monopoly on specialist health service jobs.
CONCLUDING DISCUSSION

The aim of this dissertation is to investigate how organizational change at Norwegian hospitals affects individual employees’ sickness absence, disability retirement and turnover. I investigate whether certain categories of employees with a marginalized position in the labour market due to health and low education are more affected than others. The empirical analyses have shown that organizational change increases sickness absence at all levels of hospital staff. Mergers increase the risk of disability retirement only amongst employees with the lowest education. However, the effects are limited in both cases. Turnover within the hospital sector increases in the second year after mergers. Turnover out of the sector does not increase following mergers, for either healthy or unhealthy employees. Overall, the findings regarding sickness absence and disability retirement are in line with what has been reported in previous studies of hospital reorganization in Norway (Bernstrom and Kjekshus, 2015; Kjekshus et al., 2014; Røed and Fevang, 2007). The lack of turnover to other sectors and out of work is not consistent with expectations based on earlier research from USA (Jick, 1979; Sylling et al., 2014). In this concluding discussion, I first consider the limited impact of organizational change found. Second, I examine reasons for the increase in sickness absence but not in turnover. Third, I debate the implications of the finding that sickness absence increased for all employees, whilst the risk of disability retirement only increased for employees with low education. Finally, I conclude by considering policy implications and possible avenues of future research.

Limited impact of the organizational changes

The relatively limited effects of the organizational changes studied in this dissertation has several possible explanations. The social readjustment theory suggests that the stress of coping with transitions causes ill health (Holmes and Rahe, 1967). The empirical results support this theory. The increase in sickness absence associated with an increasing number of organizational changes suggests that organizational change has an immediate impact on the sickness of employees. However, the increases in sickness absence days associated with changing from a low degree of reorganization to a moderate or high degree of reorganization were both lower than the increase in sickness absence caused by ageing one year. Accordingly, the transitional stress associated with the organizational changes most likely has been limited.

A second group of stress theories emphasize the unhealthy effects of chronic stress caused by a strain-inducing psycho-social working environment (Bakker and Demerouti, 2007; Karasek et al., 1981; Siegrist, 1995). According to these theories, ill health may be a consequence of
organizational changes if the changes lead to increased demands, diminished control or skew
the effort-reward balance or the balance between job demands and resources. Negative aspects
of the working environment are assumed to cause ill health through chronic stress. The models
presuppose lasting alterations to the working environment increasing the allostatic load over
time. If mergers result in more strain-inducing jobs, the risk of turnover and disability pension
entry should stay consistently higher after the mergers than before. This is not the pattern
suggested by the analyses in articles 2 and 3. Rather, the effect on disability pension entry is
only significantly higher in the second year after the merger. The risk of turnover is also only
higher in the second year, and only significant for turnover within the hospital sector. As argued
in article 3, the within-sector turnover associated with mergers is most likely a direct and desired
consequence of the mergers. The empirical results do not seem to support the assumption that
mergers have a lasting detrimental effect on the psycho-social working environment. However,
lasting effects of mergers cannot be completely ruled out. In compliance with the theory of
adaptation (Diener et al., 2006), employees might adapt to deteriorated working conditions after
a period of time, reducing their impact on health in the long run.

The stress of job insecurity as a link between organizational change and sickness has also been
documented (Ferrie et al., 1998), especially in research on downsizing and downsizing
survivors (Ferrie et al., 2008). Another explanation of the quite moderate effects of
organizational change on employees in this dissertation might be that the changes studied here
did not entail downsizing. This dissertation’s results are in line with an interpretation that the
organizational changes studied here did not entail drastically increased job insecurity for the
employees. Job insecurity can be divided into job tenure insecurity and job status insecurity
(Gallie et al., 2016). There is a high demand for labour in the Norwegian hospital sector, and
employees probably have not feared losing their jobs. However, a merger does involve some
uncertainty regarding identity and status (Carnall, 1986; Colman, 2011). Other studies of
Norwegian hospital mergers has shown that sickness absence increased in the second year after
the merger, most likely associated with the organizational changes that followed (Kjekshus et
al., 2014). The passing effect on sickness absence could be caused by status insecurity, as this
insecurity is likely to pass when the changes are completed. However, as mentioned earlier, the
increases seen in sickness absence were quite small, suggesting only a limited increase in job
insecurity.
Explaining higher sickness absence without increased turnover

Turnover and sickness absence have been shown to be two alternative responses to diminishing health or deteriorated working conditions (Josephson et al., 2008; Nordström et al., 2014). According to the Exit-Voice-Loyalty theory, employees have two main choices for actively confronting unfavourable working conditions – to leave the organization or try to remedy the situation by voicing their opinion (Hirschman, 1970). The analyses in article 3 suggest that employees of the Norwegian hospital sector do not resort to exit as a response to organizational changes. One explanation might be that the near state monopoly on hospital services means that alternative employment opportunities for professional workers are limited, at least outside of the largest cities. Voice or passive responses might therefore be the only available options. In this regard there may be differences between the professional groups, as Fjeldbraaten (2010) describes. Whilst nurses seemed to reluctantly conform to the changes they opposed, physicians to a greater degree translated the managerial goals into medical goals, at the same time actively resisting incompatible changes.

Placed in the exit, voice, loyalty and neglect framework (Berntson et al., 2010), the physicians used predominantly active response options. Physicians’ status and professional identity might leave them more compelled to voice their opinions, as they have a history of influence over the hospitals. Nurses, on the other hand, passively conformed to the changes. The increase in sickness absence seen in article 1 and in previous research (Kjekshus et al., 2014) may be understood as a result of passive responses such as loyalty or neglect. If the increase in sickness absence were to be interpreted as a sign of passive responses to organizational changes, we would expect a greater increase in the sickness absence of nurses than that of physicians. This is not what the analyses in article 1 suggest. On the contrary, there were no significant differences between physicians and nurses in the effect of organizational changes on long-term sickness absence. This dissertation’s analyses do not therefore support the theory that sickness absence has been used as a passive response to organizational change. Loyalty, not only to the hospitals as employers, but to their professional standards and patients also, might have kept nurses from resorting to sickness absence as a form of neglect. An objection may be raised that short-term and self-certified absence are more affected by such avoidance behaviour.

A more demanding, less inclusive working life?

The dissertation’s empirical results suggest that the effect of organizational change on employees is short term. Sickness absence can be a coping mechanism that allows strained employees to temporarily withdraw from a demanding situation, at the same time keeping them
in the organization. The increased sickness absence associated with an increasing number of organizational changes in article 1, even amongst employees assumed to have good job quality and a high level of control over their work, supports this argument. The lack of turnover out of the hospital sector amongst both healthy and unhealthy employees suggests small impacts of the changes on employees’ job quality. Taken together, these results suggest that it is unrest or increased demands associated with the changes themselves that lead to the increase in sickness absence.

As mentioned earlier, adaptation might be an alternative explanation for the relatively limited effects of organizational change seen in this dissertation (Diener et al., 2006). However, article 2 shows that there are some employees who do not get a chance to adapt to any changes following hospital mergers, but instead enter disability retirement. The increased risk of disability retirement following a merger was only significantly higher for employees with education up to and including secondary level. The employees with the lowest education have the worst health (Bartley, 2004; Marmot and Wilkinson, 2006), the lowest job quality (Siegrist and Theorell, 2006) and the weakest attachment to the labour market (McIntosh, 2004). This suggests that it is the employees with the most marginal position in the labour market who have the highest risk of being excluded from the labour force following organizational change. Being granted a disability pension requires physician certification documenting at least a 50% reduction in working ability due to a medical diagnosis. As previously discussed, the loss of working ability might both be caused by deteriorating health and increasing demands at work or in life (Westin, 1990). Also, researchers have argued that disability retirement might be used as a form of ‘grey’ early retirement (Buchholtz et al., 2006). Nevertheless, whether the health resources of these employees became inadequate or they were unofficially made redundant in the new merged organization, the results do indicate some cause for concern. The raft of seemingly small changes and proceeding adaptations might add up to significant alterations in the quality of work. The increased rate of change in modern working life as suggested by Cappelli et al. (1997) involves a risk that working life also becomes less inclusive over time.

**Policy implications and future research**

The limited effects of organizational change found in this dissertation must be interpreted in the context of the organization of work and welfare in Norway. The behaviour of employees cannot be separated from the benefits offered by the welfare state. The welfare state provides institutions that direct which forms of behavioural responses are available to individuals. Paid sickness absence and disability pension are options available due to the welfare state. Changing
employers is less risky when sickness benefits and other welfare arrangements are not governed by the employer, but provided by the state. The possibility of entering sickness absence during difficult organizational changes can be seen as one expression of what Giddens (1998) points to as the role of the state in offering protection and supporting people during periods of transition in their lives. Likewise, the institution of employee participation ensures that employees and employers act as a team when organizational changes are implemented, possibly reducing the impact of the changes on job insecurity (Gallie et al., 2016).

The case studied in this dissertation is the Norwegian hospital sector. Employees of Norwegian hospitals are distinct in several ways. Employees are predominantly female. The sector is dominated by two professions, physicians and nurses. Unionization is high, as it is in the rest of the public sector. More studies on organizational change in other sectors and other countries will be informative about in which contexts organizational change is negative and in which it is positive for the well-being of employees.

The data available to this project has brought both strengths and weaknesses. The longitudinal, objective individual data combined with measures of organizational change on an aggregated level allows for the use of robust statistical methods and avoids missing data and response bias. On the other hand, the aggregated measures of organizational change leave me unable to determine precisely which aspects of the organizational changes have a negative influence on employees, reducing the practical implications of this study. The lack of data on the employee’s working environment is another significant limitation. As is the lack of data on short-term sickness absence. The motivational component is most likely more prominent in short-term absences, and it is possible that the effects of organizational changes are greater for short-term sickness absence. Future studies combining measures of organizational change with consequences for the individual employee’s job quality on one side and both subjective and objective measures of health and well-being on the other, are needed to understand how organizational change influences the employees. Moreover, a salutogenic approach might also be informative in exploring which type of organizational changes are positive for the health and well-being of employees.

This dissertation finds that mergers and internal organizational changes at Norwegian hospitals have had a limited effect on employee sickness absence, disability retirement and turnover. I argue that it is most likely the increased demands and strain associated with the changes themselves that cause the slightly increased sickness absence. Few differences were shown between categories of employees. However, the employees with the most marginal position in
the labour market also had the highest risk of disability retirement following organizational change.
REFERENCES


Reorganization increases long-term sickness absence at all levels of hospital staff: panel data analysis of employees of Norwegian public hospitals

Mari H Ingelsrud

Abstract

Background: The Norwegian specialist health service has undergone many processes of reorganization during the last three decades. Changes are mainly initiated to increase the efficiency and quality of health care serving an ageing population under the condition of a diminishing labour supply. The aim of this study is to investigate the effects of reorganization on long-term sickness absence among different levels of hospital staff.

Methods: The study draws on panel data on employees of Norwegian public hospitals in 2005 and 2007 (N = 106,715). National register data on individual employees’ days of medically certified long-term (>16 days) sickness absence were linked with survey measures of actual reorganization executed at each hospital in each year. The surveys, answered by hospital administration staff, measured five types of reorganization: merging units, splitting up units, creating new units, shutting down units and reallocation of employees. The variation in sickness absence days was analysed using random and fixed effects Poisson regression with level of reorganization as the main explanatory variable.

Results: The fixed effects analysis shows that increasing the degree of organizational change at a hospital from a low to a moderate or high degree leads to an increase in the number of days of long-term sickness absence of respectively 9% (95% CI: 1.03-1.15) and 8% (95% CI: 1.02-1.15). There are few significant differences between employees in different education categories. Only physicians have a significantly higher relative increase in days of long-term sickness absence than the control group with lower tertiary education.

Conclusions: Increased long-term sickness absence is a risk following reorganization. This risk affects all levels of hospital staff.

Keywords: Sickness absence days, Sick leave, Organizational change, Register data, Fixed effects Poisson regression, Hospital, Norway

Background

Restructuring is increasingly being employed as a management strategy in the public sector, and consequently, in the health sector all over the world. Additionally, in Norway the specialist health service has undergone major changes since the mid-1990s. These have mainly been initiated to increase efficiency and quality in the health services to meet the challenges of an ageing population and diminishing labour supply [1]. The impact of restructuring on the health of employees is not fully understood and more research is needed [2]. This study contributes to the field by investigating the effects of reorganization on the number of days of long-term sickness absence taken by employees at all levels of the Norwegian public hospitals.

Earlier studies of the effects of restructuring on health, sickness absence and morbidity have mostly focused on downsizing and downsizing survivors, with inconclusive results. Downsizing has been shown to increase sickness absence is some studies [3,4], but others find no such...
Several studies have revealed that restructuring not involving layoffs can have a detrimental effect on health. Studies of reorganization and downsizing were associated with increased sickness absence among nurses. The effect of reorganization on employee health is thus likely to be more severe for those with the lowest education. However, the lower level staff may not be very involved in the hospital’s reorganization processes and may not therefore be affected by the changes to the same degree as the higher level staff. There are conflicting theories with respect to which employee categories are likely to be most affected by reorganization. The second aim of this article is to investigate how long-term sickness absence among different levels of hospital staff is affected by the reorganization.

Methods

Data

The register based employment statistics of Statistics Norway was used to link individual information on the employees to organizational characteristics of the hospital where they work. The target population was all employees of the Norwegian public hospitals in the third week of November in 2005 and 2007. Individual data was collected from the national register data containing demographic information, information about work, education and welfare receipt, including sickness absence spells of more than 16 days, from 1992 to 2008.

The organization of the Norwegian specialist health sector has been tracked by biannual surveys sent to all specialist hospitals in Norway since 1999. Questions about organizational changes made during the last 12 months were added to the questionnaire in 2005. This paper analyses data from 2005 and 2007. In 2005, 52 out of 63 (83%) public hospitals answered the questions about reorganization. Between 2005 and 2007 several hospitals were merged, lowering the total number of hospitals surveyed. In 2007, 52 out of 57 (91%) public hospitals answered the same questions. 48 hospitals answered the questions in both years. Only employees who were employed in the same job for the whole year in 2005 or 2007 were included, leaving a sample of 106,715 observations (person-years).

All hospitals in Norway have a surgical and medical field of operation (divisions), either localized in distinct units or sharing some units, for example hospital beds. In cases where there was more than one medical or surgical division, or where the divisions were in separate locations, the hospitals were asked to answer one questionnaire per division. A department manager usually answered the survey. Most of the hospitals (60–80%) returned one questionnaire each for the medical and surgical operational divisions. Some only returned questionnaires for one of the operational divisions (15–30%), and even fewer (3–12%) returned questionnaires from between 3 and 6 different operational divisions. As there is no record of where in the hospital each employee works, information from the surgical and medical divisions was aggregated to the
hospital level before merging with individual records. This study can be understood as investigating the net effects of concrete organizational changes at a hospital.

The study was approved by the Regional Committees for Medical and Health Research Ethics (REK) and the Norwegian Social Science Data Services (NSD).

Reorganization

The types of reorganization measured in this survey were 1) merging units, 2) splitting up units, 3) creating new units, 4) shutting down units and 5) reallocation of employees. The questionnaire asked for the number of changes in the last twelve months prior to the questionnaire being answered. For 2005 this therefore covers changes in the hospitals from autumn 2004 to autumn 2005. The 2007 data covers changes in the hospital from autumn 2006 to autumn 2007. Response options were "no", "yes, once" and "yes, more than once". These responses were recoded into values 0, 1 and 2. The questions were recorded for the medical and surgical divisions, and aggregated to the hospital level as average times the change occurred per division. It is likely that many changes are more stressful than one change. As a proxy for degree of reorganization, the total number of the organizational changes is used. The variable has a theoretical span from 0: "no changes in any of the hospital's divisions" to 10: "more than one change of each type in all of the hospital's divisions", but the average number of changes reported in 2005 and 2007 were 2.2 and 2.8 reorganizations per division. The variable is divided into a dummy set of 3 variables: low degree (on average 1.5 or less), moderate degree (on average 1.5 to 3) and high degree of reorganization (on average more than 3).

Sickness absence

The outcome variable is the yearly aggregated number of days of sickness absence spells lasting longer than 16 days. In the Norwegian public sector sickness absence is fully reimbursed from the first day of absence, with a maximum duration of one year. The first 16 calendar days of absence are paid by the employer. Benefits from the 17th day are paid by the national health insurance and only sickness absence spells of this length and above are recorded in the register data. Sickness absence is recorded for the calendar years 2005 and 2007 as number of days per year, including the 16 days that are covered by the employer.

Education

Education is often used as a measure of socioeconomic status, along with income and occupation, and has a strong correlation with disease [18]. Every citizen's education is registered using the Norwegian Standard Classification of Education. The register has information on the highest completed level of education, including the specific field. Two major professions in the specialist health sector, physicians and nurses, are possible to identify from the data because they require specific vocational training. The specific occupation of other health staff can also be identified based on field of training. However, for many of the employees in the hospitals, for example in the administration, it is not possible to identify specific occupations based on field of education. Education level is coded into seven dummy variables based on both level and field of education: Primary education (up to 10 years of school), secondary health training (up to 14 years), other secondary education (11 to 14 years), trained nurses (lower tertiary college degree), other lower degree tertiary education (up to four years of university or college education), physicians (higher tertiary university degree) and other higher degree tertiary education (five years or more in university or college).

Control variables

Gender is coded as male (1) and female (0). Age is coded in years. In the fixed effects analyses, ageing and the passing of time are perfectly collinear. Thus, it is not possible to distinguish between ageing and time effects, and they are in effect included in the same variable.

Statistical methods

In order to investigate the effects of reorganization on sickness absence, the variation in sickness absence and level of reorganization in the employee's workplace was analysed with panel data models. Panel data models are more efficient than OLS, because they exploit the longitudinal structure of the data while controlling for the serial correlation in errors that is a consequence of the same individual occurring twice in the data. The dependent variable, number of days of long-term sickness absence, is count data. These types of data are best modelled with Poisson regression. Random effects Poisson regression provides the most efficient estimator of the effect of reorganization on long-term sickness absence, utilizing both the variation between employees and within employees over time [19].

However, selection is an issue when studying the effects of reorganization on health, as the workplaces or employees susceptible to reorganization might be different on unobserved characteristics like general health. Random effects models, like cross-sectional studies, do not control for this type of omitted variables bias.

The panel structure of the data allows for consistent estimation of the fixed effects model. Fixed effects Poisson models are used to analyse how changes in the amount of reorganization and changes in sickness absence vary within the same person from 2005 to 2007. This eliminates the omitted variables bias caused by the time-constant
unmeasured characteristics that differ between hospitals and employees [19]. In the case where there is no selection, the fixed and random estimators are the same. This is tested with a Hausman test [19].

One disadvantage of the fixed effects model is that only coefficients for variables that vary over time can be estimated. Another disadvantage of the fixed effects Poisson model is that respondents without a change in the number of days of long-term sickness absence from 2005 to 2007 are dropped from the analysis [19]. The practical consequence is that the fixed effects results are based on the employees that have some sickness absence in at least one of the years, leaving out those that are the most healthy. If the model is correctly specified and the effects are constant throughout the population, this does not present a problem, other than the lowered sample size widening the confidence intervals. However, it is not given that the effect of restructuring is constant across the population. This assumption is to some degree tested by running random effect regressions on both the total sample and the fixed effects sample, checking for differences in average effect sizes between the two samples. As another sensitivity test, I have run the models using linear fixed effects regression (not shown), which includes all respondents with data for both years. The linear fixed effects models display similar results to the Poisson regressions, and are not commented upon further.

The interpretations of the two models are different: the fixed effects estimators show how much the number of days of long-term sickness absence increases from one year to the next if the level of reorganization in an employee’s workplace changes from low to moderate, or low to high. The random effects model uses the optimal combination of within and between variation, so the estimators also include information on how much higher the number of days of long-term sickness absence are for employees at hospitals with a moderate or high level of reorganization compared to employees at hospitals with a low level of reorganization. Any selection of workers into hospitals that are more prone to reorganize is not controlled for in random effects. By running both the random and fixed effects models, the study takes advantage of each model’s merits.

Fixed and random effects Poisson regression models are first run on a base model to investigate the effect of reorganization across all employees. Interaction effects between reorganization and the dummy variables for education are then included to test whether the effects of reorganization are different for different education categories. The regression analyses are conducted using the xtpoisson command with FE and RE options in Stata 12. All models are run with the vce(bootstrap) option with 400 repetitions to obtain cluster robust standard errors [20].

Results

Descriptive statistics

Descriptive statistics for the sample are presented in Table 1. There is a strong social gradient in the distribution of long-term sickness absence days. The lowest educated group has on average 39 days of long-term sickness absence per year, while physicians have an average of 9.4 days. The differences reflect the social gradient in health [16]. The average number of days of long-term sickness absence per year rose from 23.3 in 2005 to 24.8 in 2007. This is in accordance with other statistics on sickness absence in the Norwegian health sector, showing a rise from 2005 to 2007 [21]. The quite large standard deviations for the sickness absence statistics show that the average number of days of long-term sickness absence is elevated by the few employees with very long (limited to one year) sickness absence spells.

Multivariate analysis

Results from the base models are shown in Table 2. Both random and fixed effects models were run. The results of a Hausman test showed that the estimators in the two models are significantly different (chi-square: 7915, p<0.001), and that the random effects estimators are biased [19]. To test if there is any selected sample bias due to the fact that the fixed effects model is run on only the most absent part of the sample, random effects Poisson regressions were done for both the full sample and the fixed effects sample (not shown). The coefficients for reorganization are somewhat higher when random effects is run on the fixed effects sample than on the full sample (in the analysis presented in Table 2 the coefficient for a moderate degree of reorganization increases from 0.13 to 0.17. The coefficient for a high degree increases from 0.11 to 0.14). This may be understood as there being some sample bias, where the effects of restructuring on sickness absence may be somewhat higher for the included sample than for the rest of the population. Nonetheless, the fixed effects coefficients of reorganization are smaller than the random effects, so the most sober estimates are commented upon in this article. Looking at the fixed effects estimates, employees at hospitals that increased the degree of reorganization from low to moderate from 2005 to 2007 have had a 9% increase in number of sickness absence days in the same period. Increasing the degree of reorganization from low to high from 2005 to 2007 led to an 8% increase in sickness absence spells. The base models in Table 2 have been run for both employees over the age of 54 and for those that are 54 years or younger (not shown). Although the coefficients for reorganization for those over 54 years are higher than for those that are 54 years or younger, the confidence intervals are...
overlapping, and the effects of reorganization are still significant for the age group under 54 years.

The results of the random and fixed effects Poisson regression models including the interaction effects for education are shown in Table 3. The coefficients in the random effects model are slightly higher than in the fixed effects model, but the main findings are the same. The F-test of the interaction terms between education category and the reorganization dummy set in the fixed effects model shows that the differences in effect size between the categories are just above the level of statistical significance (p = .058). The interaction terms are barely significant in the random effects model (p = .032). Only physicians have a significantly higher relative effect of a high degree of reorganization on sickness absence than the reference group with lower tertiary education. This indicates that employees at all levels of the hospitals are affected by the organizational changes.

Table 1 Descriptive statistics by education and year for the sample used in the random effects analyses

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sickness absence, days (spells of 16 days or longer)</th>
<th>Age</th>
<th>Reorganization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>% included in FE analysis</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>55,933</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>50,782</td>
<td>31%</td>
<td></td>
</tr>
</tbody>
</table>

Baseline characteristics in 2005 by education

Primary
- N = 4,048
- % = 7%
- % included in FE analysis = 35%
- Mean = 39.0
- SD = 75.3
- Male = 18%
- Reorganization: Low (<=1.5) = ·
- Moderate (1.5-3) = ·
- High (>3) = ·

Secondary
- N = 7,463
- % = 13%
- % included in FE analysis = 30%
- Mean = 26.5
- SD = 61.6
- Male = 24%
- Reorganization: Low (<=1.5) = ·
- Moderate (1.5-3) = ·
- High (>3) = ·

Secondary health training
- N = 6,830
- % = 12%
- % included in FE analysis = 38%
- Mean = 32.0
- SD = 66.7
- Male = 7%
- Reorganization: Low (<=1.5) = ·
- Moderate (1.5-3) = ·
- High (>3) = ·

Tertiary, lower
- N = 9,376
- % = 17%
- % included in FE analysis = 25%
- Mean = 19.3
- SD = 52.0
- Male = 20%
- Reorganization: Low (<=1.5) = ·
- Moderate (1.5-3) = ·
- High (>3) = ·

Trained nurses
- N = 21,608
- % = 39%
- % included in FE analysis = 28%
- Mean = 22.1
- SD = 54.5
- Male = 8%
- Reorganization: Low (<=1.5) = ·
- Moderate (1.5-3) = ·
- High (>3) = ·

Tertiary, higher
- N = 1,702
- % = 3%
- % included in FE analysis = 15%
- Mean = 14.1
- SD = 42.7
- Male = 39%
- Reorganization: Low (<=1.5) = ·
- Moderate (1.5-3) = ·
- High (>3) = ·

Physicians
- N = 4,906
- % = 9%
- % included in FE analysis = 14%
- Mean = 9.4
- SD = 35.6
- Male = 66%
- Reorganization: Low (<=1.5) = ·
- Moderate (1.5-3) = ·
- High (>3) = ·

Table 2 The effect of reorganization on number of days of long-term sickness absence

<table>
<thead>
<tr>
<th>Change in number of days</th>
<th>Coeff.</th>
<th>IRR</th>
<th>95% CI</th>
<th>Change in number of days</th>
<th>Coeff.</th>
<th>IRR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random effects</td>
<td></td>
<td></td>
<td></td>
<td>Fixed effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education: Reference cat. Tertiary, lower degree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>1.50***</td>
<td>1.35-1.67</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Secondary</td>
<td>1.16*</td>
<td>1.04-1.29</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Secondary health training</td>
<td>1.38***</td>
<td>1.26-1.52</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trained nurses</td>
<td>1.38***</td>
<td>1.28-1.49</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tertiary, higher degree</td>
<td>0.76**</td>
<td>0.63-0.91</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Physicians</td>
<td>0.51***</td>
<td>0.45-0.58</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age</td>
<td>1.11***</td>
<td>1.09-1.12</td>
<td>1.14***</td>
<td>1.12-1.16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>0.42***</td>
<td>0.39-0.46</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reorganization (Low as reference)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1.13***</td>
<td>1.06-1.20</td>
<td>1.09**</td>
<td>1.03-1.15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>High</td>
<td>1.11**</td>
<td>1.05-1.18</td>
<td>1.08**</td>
<td>1.02-1.15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Constant</td>
<td>0.41**</td>
<td>0.25-0.68</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Poisson regression. Incidence Rate Ratio shown with 95% confidence intervals using robust standard errors computed with vce(bootstrap). Significance probabilities (**p < .01, *p < .05).
The analyses show that increasing the degree of reorganization (merging units, splitting up units, creating new units, shutting down units and reallocation of employees) at a hospital leads to an increase in sickness absence. This is in line with previous research showing that reorganization leads to work-related health problems [8] and sickness absence [4,7]. Theoretically relevant mechanisms by which reorganization leads to higher sickness absence are increased demands on employees, reduced sense of control, increased job insecurity, or a combination of these. How each of these mechanisms contributes to the effect of reorganization is outside the scope of this article, but it has been shown here that the net effect of increased reorganization is higher sickness absence.

Due to the fact that organizational change is a hospital level measure, the variation between employees is limited. This leads to large standard errors and low explained variance. The results show that employees at all levels of the hospitals are affected by reorganization. Only physicians have a significantly higher effect of a high degree of reorganization, compared to the reference category. The analysis does not support the claim that reorganization leads to relatively more sickness absence for the lowest educated employees. However, it is important to point out that even though the relative effect of reorganization on sickness absence is not significantly higher for those with primary education, the confidence intervals are wide. This is also the group with the most sickness absence days, and the social gradient in sickness absence [16] is still striking after reorganization is taken into account.

There are several possible explanations for these results; one explanation is that employees in different education categories might be affected by organization changes to different degrees. The results might reflect that the lowest educated employees are less involved in the reorganization processes at a hospital than the higher educated employees. Maybe they are only aware of the changes that affect their specific work unit, while the higher educated employees are more involved in the whole reorganization process right from the initial planning. Responsibilities concerning the effects of the organizational changes are also less likely to lie with the lowest educated. The increase in demands and/or loss of control during a restructuring process might therefore be greatest for the highest educated. A qualitative study of the reorganization processes at one Norwegian teaching hospital found that physicians in particular, but also nurses were stretched between the demands of giving good care and

### Table 3 The effect of reorganization on sickness absence - education interaction effects

<table>
<thead>
<tr>
<th>Change in number of days</th>
<th>Change in number of days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Random effects</td>
</tr>
<tr>
<td></td>
<td>Coeff. IRR CI</td>
</tr>
<tr>
<td>Age</td>
<td>1.10*** 1.09-1.12</td>
</tr>
<tr>
<td>Reorganization (low degree as reference) Moderate (Tertiary, lower)</td>
<td>1.15 0.98-1.34</td>
</tr>
<tr>
<td>High (Tertiary, lower)</td>
<td>1.01 0.86-1.19</td>
</tr>
<tr>
<td>Primary × moderate</td>
<td>0.85 0.68-1.07</td>
</tr>
<tr>
<td>Primary × high</td>
<td>1.13 0.88-1.45</td>
</tr>
<tr>
<td>Secondary × moderate</td>
<td>1.01 0.83-1.23</td>
</tr>
<tr>
<td>Secondary × high</td>
<td>1.13 0.92-1.39</td>
</tr>
<tr>
<td>Secondary health training × moderate</td>
<td>0.99 0.80-1.22</td>
</tr>
<tr>
<td>Secondary health training × high</td>
<td>0.99 0.80-1.22</td>
</tr>
<tr>
<td>Trained nurses × moderate</td>
<td>1.01 0.85-1.19</td>
</tr>
<tr>
<td>Trained nurses × high</td>
<td>1.12 0.93-1.35</td>
</tr>
<tr>
<td>Tertiary, higher degree × moderate</td>
<td>0.96 0.57-1.63</td>
</tr>
<tr>
<td>Tertiary, higher degree × high</td>
<td>1.41 0.78-2.56</td>
</tr>
<tr>
<td>Physicians × moderate</td>
<td>1.08 0.78-1.50</td>
</tr>
<tr>
<td>Physicians × high</td>
<td>1.51* 1.05-2.19</td>
</tr>
<tr>
<td>N (Person-years)</td>
<td>106,715</td>
</tr>
<tr>
<td>N (Persons)</td>
<td>68,630</td>
</tr>
</tbody>
</table>

Note: Poisson regression. Incidence Rate Ratio shown with 95% confidence intervals using robust standard errors computed with vce(bootstrap). Significance probabilities (***p < .001, *p < .05).

Gender and main effects for education were included in the random effects model.
administerive involvement in the planning, building of and moving to a new hospital [22]. Another study of the same hospital reorganization reported that the lower level staff were less involved in the reorganization processes [17]. The perceived loss of control during a reorganization process might also be greater for the higher educated, as they are used to having a relatively high degree of control compared with lower level employees. The highest educated may experience some sort of relative deprivation [23] when they compare the amount of control and demands that they encounter at work to what they were used to before the reorganization process started, or to the level encountered by colleagues at hospitals that are not reorganizing.

Employee attendance, or conversely, absenteeism, is likely to be influenced by both motivation and ability to attend work [24]. Even though the long-term sickness absence measured in this article is physician certified, it is important to draw a distinction between disease and sickness absence. In addition to disease, sickness absence is dependent on personal attitudes, social attitudes and the physician’s comprehension of the situation [25]. Analyses of data from the UK Whitehall II study of civil servants showed that absence spells longer than seven days were more strongly correlated with self-reported health, long standing illness and other measures of health than shorter sickness absence spells [26]. As only longer spells of absence are registered in this study’s data, it is likely that absence spells that are largely motivation-related, are at a minimum in these data. However, the length of an absence spell may be prolonged by motivation factors, as well as an impaired state of health. The social and motivation-related aspects of sickness absence must be kept in mind, and the results of these analyses cannot solely be attributed to the individual’s impaired state of health.

Strengths and limitations
The register data used in these analyses are a detailed, unbiased longitudinal source of information on all employees of Norwegian public hospitals. However, many variables are not included. A limitation of the study is the lack of information concerning the mechanisms by which reorganization leads to sickness absence: job insecurity, rewards, demands, control and other measures of psycho-social work characteristics are not recorded in the data. Neither is health behaviour or other measures of health.

The administrative data source of reorganization ensures that there is no personal bias in the reports. It is unfortunate that reorganization is not recorded per employee. This is likely to give underestimated measures of the effect of reorganization on sickness absence, since it is not possible to differentiate between employees at the same hospital who are personally affected by different amounts of reorganization.

The longitudinal nature of the data allows for the use of fixed effects analysis to control for unobserved time-constant characteristics among the employees. It does not, however, control for unobservable characteristics that vary over time. This can be changes in HRM policies or management at the hospitals. To the extent that these covary with both sickness absence and reorganization, the estimates from the fixed effects regression can be biased upward. The estimates must not be interpreted as pure causal effects of reorganization, as all unobserved heterogeneity might not be factored out.

A characteristic of the fixed effects Poisson model is that only employees with a change in the dependent variable from 2005 to 2007 are included in the analyses, excluding those with no long-term sickness absence in any of the years. This increases the standard errors, but might also limit the generalizability of the estimator if the effects are not constant throughout the population. The analyses suggest that there is some sample bias, where the effects of reorganization on sickness absence might be somewhat higher for the included sample than the rest of the population.

The aim of this study was to analyze the effect of reorganization on sickness absence in Norwegian public hospitals. In this part of the public sector reorganization does not usually include lay-offs [27]. The Norwegian health sector is characterized by a high proportion of female employees, shift work and a high incidence of part-time work [21]. Furthermore, unemployment is very low in Norway and social security benefits are quite generous. These characteristics let us study the effects of reorganization on sickness absence separate from effects of unemployment and fear of being laid off. The effects of reorganization in the Norwegian labour market are likely to be different than in other labour market contexts. These findings may therefore not be directly generalized to other countries and markets. Still, research on the effect of reorganization on sickness absence is needed in various labour market contexts, and in both the private and public sector. A comparative analysis of the effects of reorganization in various labour market contexts may be informative as to which types of mechanisms are in play.

Conclusion
This study suggests that reorganization has a detrimental effect on long-term sickness absence among employees at all levels of the hospital. Consequences of reorganization for the health of employees should be considered before changes are launched, as increased sickness absence is likely to be one of the costs.
Competing interests

The author declares that they have no competing interests.

Acknowledgements

The research was funded by the Norwegian Research Council (grant number 195614). This research is part of the project “Reorganizing the specialist health services; what are the individual consequences for the employees?”. Helpful comments from Arne Mastekaasa, Espen Dahl and the members of the project are greatly appreciated. The conclusions remain the responsibility of the author.

Received: 17 January 2014 Accepted: 17 September 2014 Published: 19 September 2014

References


