Is there less labor market exclusion of people with ill health in 'flexicurity' countries? Comparative evidence from Denmark, Norway, the Netherlands, and Belgium

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Abstract

Higher employment rates among vulnerable groups is an important policy goal, and it is therefore vital to examine which (mix of) social policies that are best able to incorporate vulnerable groups – such as people with ill health – into the labor market. We examine whether there is less labor market exclusion among people with ill health in the two 'flexicurity' countries Denmark and the Netherlands, compared to the neighboring countries of Norway and Belgium. The two country pairs of Denmark—Norway and the Netherlands—Belgium are analyzed using OLS regressions and propensity score kernel matching of EU-SILC panel data (2010—2013). Both unemployment and disability likelihood is remarkably similar for people with ill health across the four countries, despite considerable social policy differences. There are three possible explanations for the observed cross-national similarity. First, different social policy combinations could lead towards the same employment outcomes for people with ill health. Second, most policy instruments are located on the supply side, and demand side reasons for the observed 'employment penalty' (e.g. employer skepticism/ discrimination) are often neglected. Third, it is too demanding to hold (full time) employment for a sizeable proportion of those who have poor health status.

Keywords: Health inequality; comparative social policy; flexicurity; propensity score matching; unemployment; disability; health selection.

Introduction

People with ill health often struggle to gain firm attachment to the labor market. Holding a job is important for the individual him-/herself, because it ensures income and self-worth, and improves social integration and participation. Furthermore, high employment rates is important for society as a whole, because it will generate more tax revenues. It is therefore highly desirable to 'move' people with ill health from benefits (unemployment/disability) to employment. In order to do so, we need knowledge about which mix of social policies that provide the best employment opportunities for people with ill health. The current paper contribute towards this end through a comparative study of Denmark, Norway, the Netherlands, and Belgium.

All four countries have advanced social welfare systems with relatively generous unemployment and disability benefits, and high tax levels. Consequently, the policy contexts are to some extent similar. However, there are some noticeable differences as well that could be of vital importance for labor market exclusion among people with health problems. Because our comparison is restricted to four countries, we are able to describe the most important policies comprehensively. We are particularly interested in the 'flexicurity' model, of which Denmark and the Netherlands are the perhaps two most prominent examples in Europe. The contrast to Belgium and Norway makes for an interesting case study of whether a 'flexicurity' policy mix is better able to integrate people with health problems into the labor market. We analyze EU-SILC panel data

(2010-2013) using OLS regressions and propensity score matching (PSM), and ask the following overarching research question:

Is labor market exclusion (as indicated by unemployment and disability likelihood) less prevalent among people with ill health in the 'flexicurity' countries Denmark and the Netherlands, compared to Norway and Belgium?

Previous research

The presence of health selection processes on the labor market is reasonably well established empirically[1]. Individuals with health problems are both more likely to be unemployed[2], and to remain so for longer periods of time[3]. Yet, a growing body of studies have also found that the relationship between poor health and employment status varies between countries and across institutional settings, indicating that certain welfare state policies and programs could play an important moderating role. We devote some attention to these studies in the following.

Studies comparing Sweden and the U.K. conclude that the employment outcomes are better for those with ill health in the former (and more regulated) labor market[4,5]. Correspondingly, data for 26 European countries show that people with ill health have lower levels of non-employment in more generous welfare states[6]. There also seem to be differences *within* the generous Scandinavian countries, where people with ill health are more disadvantaged regarding unemployment[7] and temporary work

contracts[8] in Denmark, especially compared to Norway. In addition, McAllister et al.[9] show that people with ill health (and low education) have higher employment rates in Sweden than in Denmark. These latter studies indicate that country-specific social policies are of importance. Similarly, García-Gómez[10] finds that a 'health shock' is damaging for employment in Denmark and the Netherlands, but not in France and Italy (where employment quotas for the disabled are in place).

Using EU-SILC data for 26 countries, Reeves et al.[11] found that stronger employment protection did not mitigate the risk of job loss for people with ill health in European countries struggling with a severe recession. However, for countries with a 'milder' economic crisis, strong employment protection was associated with less health inequalities in the probability of job loss. Backhans et al.[12] use EU-SILC data for 21 countries and a fuzzy-set qualitative comparative analysis to examine the impact of flexicurity policies on employment likelihood among people with low education and bad health status. The study concludes that the combination of high employment rates, widespread active labor market policies (ALMP), and availablity of social services in old age is most effecient in securing high return to work rates among people with low education and ill health. There is also a second 'path' to employment for the low educated with bad health – consisting of high employment rates, low employment regulation, and low benefit levels – but this policy combination is apparently less efficient.

In summary, existing empirical evidence indicates that cross-national differences in social policies could be vital for employment opportunities (or lack thereof) for people with health problems. Note that none of the above-mentioned comparative studies examines disability and unemployment in combination. This is surprising because unemployment and disability are clearly 'competing outcomes' for people with health problems[14]. Accordingly, we wish to fill this gap in the existing literature. The current study also adds to the small, but growing literature[7-9] on health selection processes in "archetypical" 'flexicurity' countries.

Following the typology developed by Shahidi et al.[13](see table 2, page 678), we will compare results between two countries characterized by 'strict' labor market regulation and 'secure' social security efforts (Belgium and Norway), with two countries where the labor market regulation is 'flexible' and the social security efforts are 'secure' (the Netherlands and Denmark). We are therefore particularly interested in the (potential) impact of cross-national differences in labor market regulation, but we will also cover other social polices of relevance for people with ill health's employment outcomes. Consequently, through a focus on two types of *non-employment* (unemployment/disability), our aim is to shed light on the prevalence of labor market exclusion among people with health problems in Denmark, Norway, the Netherlands and Belgium. The next section outlines the social policy setting, with an emphasis on the 'flexicurity' model.

Social policy setting

The 'flexicurity' model

The Netherlands are, according to Ferrera et al.[15], "the pioneers of flexicurity", and Jensen[16] states that the Danish 'flexicurity' model has "become a central reference point in the EU's employment strategies over the last decade and, more recently, in the EU's 2020 strategy". The social policies implemented in both Denmark and the Netherlands aim towards fulfilling the needs of businesses and employees simultaneously[17]. Firms and companies need flexibility during recruitment and downsizing processes, and especially so if their profits fluctuates a lot, for instance due to fierce competition on the global market. Employees, on the other hand, need some kind of protection from the insecurities that arise because of such economic fluctuations, where long-term unemployment and drop in income (and living conditions) is the perhaps biggest worry.

The 'flexicurity' labor market model wish to reconcile the needs of businesses and employees through a combination of three major parts[18,19]. *First*, job protection tends to be quite low, and it is rather easy for employers to fire employees. This ensures that firms and companies are able to adjust effortlessly to economic shocks, and the flexible system is supposed to help the businesses survive. *Second*, the unemployment benefits are rather generous, so that employees are 'taken good care of' while out of work. Hence, the average worker has a rather high unemployment likelihood in the

'flexicurity' model, but he/she will be able to maintain a good standard of living while unemployed. *Third*, the use of active labor market policies (ALMP) is widespread (see table A1 in appendix), in an effort to reintegrate the unemployed back into the labor force as soon as possible.

One could argue that the 'flexicurity' model is especially relevant for members of vulnerable groups. Employers are often reluctant to hire labor market outsiders – such as people with ill health – because it is more difficult to observe productivity of individuals with limited work experience. Furthermore, health problems represents an obvious risk factor[8], and most employers will therefore think twice before hiring a person with bad health. If the employment protection legislation (EPL) is flexible enough, however, employers could be more inclined to give someone with ill health the opportunity, because it is easy to terminate the contract if it turns out to be a bad match for the company. Thus, vulnerable groups might have a higher labor force participation in 'flexicurity' countries. Then again, the 'flexicurity' model could also be harmful for vulnerable groups because weak EPL tilts the power balance in favor of employers, thereby opening up for groundless dismissals, possibly at the expense of people with bad/deteriorating health status. Of course, these two diverging processes are not mutually exclusive, and could operate simultaneously.

We will examine whether there is less labor market exclusion (as indicated by unemployment and disability likelihood) among people with ill health in countries

adhering to the 'flexicurity' model: Denmark and the Netherlands. In order to do so we need contrasting country cases and it is difficult to find better options than Norway and Belgium. Denmark and Norway are linguistically similar and share many institutional features. For example, both the share of public sector employees (33.6 in Denmark; 35.4 percent in Norway)[20] and the Gini coefficient (0.25) was similar in 2012[21]. Social-democratic political parties remained in power for long periods after the Second World War, which helps explain why the two Scandinavian countries are so similarly organized. Denmark—Norway was even a union for almost 300 years (1537—1814). Correspondingly, Belgium gained independence from the Netherlands in 1830, but the similarities are striking to this day. For instance, both life expectancy at birth in 2012 (80.5 in Belgium; 81.2 years in the Netherlands)[22] and the share of industrial occupations (18.6 in Belgium and 17.2 percent in the Netherlands in 2013 and 2015, respectively)[23] are comparable. Thus, we will compare empirical results for the two 'country pairs' of Denmark—Norway and the Netherlands—Belgium in the following.

Note that, according to data from OECD (see table A1), it is only regarding *temporary contracts* that the Netherlands (0.94) and Denmark (1.38) have weaker EPL than Belgium (2.38) and Norway (3.00). However, it is very important to stress the inherent skill component in the Danish model[16,24]. It is primarily among 'low-skill' workers that employment protection is weak, whereas the Law on Salaried Employees (Funktionærloven) protects the jobs of 'white collar' employees more strongly. This

implies, for example, that some employees have only five or six days' notice period, while others have six months. Thus, employees with permanent contracts often have considerably weaker employment protection than the OECD summary indicator seems to suggest, at least in 'low-skill' labor market segments in Denmark. We now proceed to the most important cross-national differences and similarities in disability and unemployment policies.

Disability and unemployment policies

Tables A2 (disability) and A3 (unemployment) in the appendix summarizes the main policy characteristics in Denmark, Norway, the Netherlands and Belgium. Due to space restrictions, we will only comment on the most important patterns here.

The two 'country pairs' are quite similar on a number of *disability policy* characteristics (table A2), but some noticeable differences appear as well. A considerably higher minimum incapacity level is needed in Belgium (66 percent) to be entitled to benefits, compared to the Netherlands (35 percent). Furthermore, the benefit is granted indefinitely in Belgium, while the Netherlands have introduced more stringent functional assessment checklist in recent years. Belgium have a lower score (26) on activation efforts (reflecting employment and rehabilitation measures) than the Netherlands (35), while Denmark and Norway have similar scores (37). Employment quotas for the disabled are not in place in any of the four countries. Lastly, there are

wage subsidies (of differing kinds) in place in both the Netherlands and Denmark, but not in Belgium and Norway.

According to the generosity measurement of Scruggs[25], Belgium (14.0—13.8) and Norway (14.2—13.9) have considerably more generous *unemployment policies* compared to the Netherlands (11.9—11.7) and Denmark (9.4—9.5) (table A3). This is perhaps surprising, given that generous unemployment benefits is one key 'flexicurity' characteristic. Belgium and Norway are more generous also when we look at the more fine-grained details. The qualification period is shorter (78 vs. 104 weeks) and the duration longer (unlimited vs. 90 weeks) in Belgium than in the Netherlands, but the replacement rates are higher in the Netherlands (especially for single people). Both coverage, duration, qualification period and replacement rates are more generous in Norway than in Denmark.

It is also important to take conditionality requirements and sanctions into account[26]. Job-search requirements, work-availability criteria, and sanctions are evaluated using data from Hasselpflug[27]. Belgium (2), Norway (2), and especially Denmark (1) have low scores, while the Netherlands (5) have high conditionality on job-search requirements. There is less cross-national differences regarding possibilities to refuse employment opportunities, with the exception of Belgium being less strict (2.75) than the Netherlands (4.0). Lastly, the sanctions in case of non-compliance with obligations are stricter in the Netherlands (5.0), than in Belgium (3.0).

In summary, there are six important policy differences:

1. The disability benefit is more permanent and there are fewer activation measures in Belgium.
2. A higher incapacity level is required to opt for disability benefits in Belgium.
3. Wage subsidies are present in the Netherlands and Denmark.
4. The unemployment benefit is more generous in Belgium and Norway.
5. There are more conditionality requirements and sanctions in the Netherlands.
6. The employment protection is weaker for temporary contracts in the Netherlands and Denmark.

Overall, we are inclined to expect that labor market exclusion is less prevalent for people with ill health in the Netherlands (vs. Belgium) and Denmark (vs. Norway). For example, the presence of wage subsidies (and weaker EPL) in the two 'flexicurity' countries could mean that fewer employers are skeptic towards hiring people with health impairments. In contrast, the more generous unemployment benefits in Belgium and Norway could lead to more labor market exclusion among those with ill health. However, some of the above-mentioned policy differences probably goes in opposite directions empirically, e.g., numbers 1 and 2 for disability likelihood in Belgium.

Consequently, the cross-national policy differences may 'cancel each other out' on average, which is why we refrain from specifying hypotheses with a clear direction.

Somewhat unexpectedly, the policy review showed that unemployment benefits are *more* generous in Belgium and Norway. Furthermore, it is only for *temporary* work contracts that the 'flexicurity' countries Denmark and the Netherlands differ noticeably on employment protection legislation. This indicates that there might be a discrepancy between 'flexicurity' policies "on paper" as opposed to "in practice". Recall that we have chosen 'contrasting cases' that are economically/politically/historically/culturally similar to the two 'flexicurity' countries, which is an advantage while trying to pin down the (potential) impact of differing policies. This implies automatically that some of the cross-national differences are 'compressed', with the generousness of unemployment benefits being the perhaps best example. Even though Denmark clearly are less generous than Norway, the benefit level is still generous in a European context (e.g., compared to the UK). Before moving on to the data and methods, we briefly cover some additional cross-national differences of potential importance for health selection.

Cross-national differences

The prevailing economic conditions could be vital for health-related social mobility on the labor market. When labor demand is low, a greater number of healthy people will probably become unemployed as well, implying that the composition of the

unemployed population becomes 'healthier' on average. Recent empirical evidence has shown that people with good health experienced more of the increase in unemployment during the Great Recession, compared to those with bad health, but only in crisis-countries such as Spain and Greece[28]. In countries with a less serious economic downturn, however, people with ill health tend to be overrepresented among the (recently) unemployed. Disability benefit utilization could also be influenced by economic conditions[29]. For example, Barr et al.[30] shows that the number of people on disability benefits increases when the unemployment level rises. The 'flexicurity' countries Denmark and the Netherlands was hit harder by the Great Recession than Norway and Belgium (see figure A1 in appendix), but none of the four countries experienced a 'full-blown' crisis where the composition of the non-employed population changes dramatically. Thus, it is unlikely that within-country changes over time in labor demand is a biasing factor for the following analyses. Nonetheless, we include calendar year dummy variables in order to account for economic conditions and other underlying time trends of importance for health selection to unemployment/disability.

A second issue related to economic conditions is *between-country differences* (see figure A1). Belgium and Denmark experienced higher unemployment rates than the Netherlands and Norway during the observational period. The average unemployment rate for 20-64 year olds during 2010—2013 was somewhat higher in Belgium (7.65)

than in the Netherlands (5.2), and markedly higher in Denmark (6.88) than in Norway (2.95). As mentioned above, the unemployed population tends to become 'healthier' on average as the unemployment rate increases. It is therefore likely that the unemployed have a larger prevalence of health problems in Norway, compared to Denmark. The differences in unemployment 2010—2013 are smaller between Belgium and the Netherlands (i.e., roughly 1.5 percentage points), which probably implies less difficulties with cross-national comparisons. Nonetheless, we need to take these between-country differences in economic conditions into account while interpreting the empirical results.

Obviously, the included countries differ on several other institutional and legislative settings. For instance, the prevalence of *part-time work* is considerably higher in the Netherlands (46.9 percent) than in the remaining three countries in 2013 (24.1, 20.9, and 24.5 for Belgium, Denmark, and Norway respectively)[31]. There are some minor cross-national differences regarding *sickness insurance* as well (see table A1). However, we are primarily interested in cross-national differences of importance for labor market exclusion among people with health problems, and we believe that the most relevant ground has been covered. Lastly, there might be systematic social inequalities in health selection to unemployment/disability, as indicated by previous research[32-34]. Consequently, we will examine whether the results differ according to educational level, gender, age, and marital status.

Data and methods

Data material

This study use longitudinal microdata from the European Union Statistics on Income and Living Conditions (EU-SILC). Both the sampling unit and mode of data collection varies between the countries included in the EU-SILC, but the data material is harmonized for comparative purposes[35], and is therefore well suited for the present paper. All individuals with valid health information in the age span 16—65[i] is included. We place no further restrictions on the samples because we wish to include as many individuals with health problems as possible. We use EU-SILC panel for 2010—2013. This specific year span is chosen because of Governmental change in Norway autumn 2013, when a right—right alliance gained power. The social policies in Norway have subsequently become less generous[ii], and we therefore believe that the pre-2013 period is best suited for the current cross-national comparative study.

Panel data enables examination of whether people who deteriorate in health tend to become unemployed/disabled. There are, however, two major challenges with the EU-SILC panel data. First, the panel is quite *short* due to the four-year rotary structure, and the maximum number of observations per individual is therefore four. Pooling several panels is not possible because we cannot locate – and statistically adjust for – the individuals who contribute with information in more than one panel. Second, the

panel is *unbalanced*, which means that not everyone is followed for all four years. These two shortcomings imply that there is quite little 'room' for within-individual change over time in the variables of interest. We deal with these challenges though the use of *propensity score matching* (more below).

Operationalization

Four measures of labor market exclusion are used as outcomes: (1) being unemployed, (2) being disabled, (3) becoming unemployed, and (4) becoming inactive. A question on current economic status is used for the two former outcomes, where *being unemployed* (yes=1,else=0) and *being disabled* (yes=1,else=0) are two of the answer categories. A second question regarding most recent change (during the past 12 months) in the individual's activity status is used for the two latter dependent variables. Respondents who have gone from being 'employed' to 'unemployed' are coded 1 on *becoming unemployed* (else=0). Similarly, people who go from being 'employed' to 'other inactive' are coded 1 on *becoming inactive* (else=0). Unfortunately, there is no specific answer category denoted 'disabled' in the question on most recent change, but it is highly likely that people who become disabled make up the main bulk of the 'inactive' category. The other main economic activity statuses (employed, unemployed, and retired) are included, and inactive will thus imply disabled 'by default'. Some uncertainty remains, however, and we need to be cautious while interpreting the results.

Throughout this paper, we refer to disability/disabled as a self-reported economic status category, i.e., as *disability benefit utilization*. Hence, people possessing a disability (for example deafness or speech disorder) can of course hold employment. We are unfortunately, due to the nature of the health information, not able to distinguish clearly between specific health conditions. Instead, we rely on two general health measures. First, limiting longstanding illness (LLSI), computed from two questions: (i) "Suffer from any chronic (longstanding) illness or condition?" and (ii) "Limitations in activities people usually do because of health problems for at least the last six months?" Respondents answering yes on both are coded 1 (else=0). Second, people are asked about their self-rated general health status (SRH). Those with 'very bad', 'bad' and 'fair' health are coded 1 on the *bad/fair health* variable ('very good' and 'good' = 0). Those with 'fair' health are included in the "bad health" category for two reasons. First, a rather low number of individuals state health to be bad and very bad (6.62, 4.07, 5.78 and 6.62 percent in Belgium, the Netherlands, Norway, and Denmark, respectively), yielding problems with low statistical power. Second, people reporting fair health could be prone to labor market exclusion as well. In addition, we use the continuous version of SRH (coded 0—4, higher values=better health) to compute a change score measure. People who report a deterioration in health (e.g., from 3 to 2) are coded 1 on *SRH health drop* (else=0).

The correlation between *LLSI* and *bad/fair health* is 0.594, 0.596, 0.511, and 0.543 in Belgium, the Netherlands, Norway, and Denmark, respectively. The correlation is rather high, but far from perfect, indicating that they measure somewhat differing aspects of health. The reliability of self-reported health measures seems to be satisfactory[36], and they are a good predictor of mortality[37].

Gender is measured by a dummy variable for women (=1). *Age* is coded into five dummies (16-25, 26-35, 36-45, 46-55 and 56-65 years), with 36-45 years as the reference category. Age and age squared is used in the OLS regressions, and the wider age categories of below 30 (young age), 30-50 (prime age), and above 50 (old age) are used in the age stratified analyses. *Educational qualifications*, based on the highest International Standard Classification of Education (ISCED) attained, consist of three dummy variables. Pre-primary, primary, and lower secondary is collapsed to primary education. (Upper) secondary and post-secondary non-tertiary is collapsed to secondary education (higher education=reference category). A dummy variable denotes being *married* (yes=1). *Years in paid employment* (and its square) measures labor market experience, while dummy variables for *part-time work*, having a *temporary work contract*, and being *self-employed*, are included to account for differences in (previous) work conditions. *Calendar year* dummy variables are included in all analyses.

Analysis

We use two analysis techniques in this study. First, we report results derived from ordinary least squares (OLS) regressions. The outcome measures are dichotomous, and non-linear models could therefore be considered a better choice. However, it is challenging[iii] to compare results across different groups and samples in logistic regression[38,39]. Since the results are compared cross-nationally, linear models[iv] are preferred throughout. Results derived from linear models have the additional advantage of being easier to interpret (differences in probabilities). The OLS analysis will provide descriptive evidence of health selection to unemployment and disability in the four countries, by adjusting for a basic set of sociodemographic characteristics. Quite parsimonious model specifications are estimated because of potential problems with multi-collinearity (caused e.g., by high correlation between educational level and previous work history). Thus, the only covariates included in the subsequent OLS regressions are gender, age, marital status and education.

The second analysis technique is propensity score matching (PSM). PSM is a strategic subsampling of the data material, where the researcher selects one (or several) non-treated control case(s) for each treated case based on observable characteristics[37]. The main idea is to construct 'statistical twins' who are similar on observable characteristics, but differ on exposure to treatment[v] (one with bad health, the other good). If the selection of 'twins' is done properly, one should arrive at the (potential)

negative effect of health on labor market outcomes by a simple comparison of mean values between 'treatment' and 'control' subjects. PSM is a non-parametric method, and does therefore not impose any functional form assumptions.

Most often, it is challenging to find treatment and control subjects who are identical on all relevant individual characteristics (e.g., age, marital status, educational qualifications, income level, previous work history, etc.). One solution to this challenge is to stratify on the propensity score (χ) itself, instead of more detailed on all the covariates included in χ[40]. That is, we reduce the multidimensional space in which people vary to a one-dimensional space, namely the propensity score (varying from 0-1). PSM use all the included covariates to arrive at the propensity score, which is a 'summary measure' of the likelihood of being treated (e.g., having ill health). Next, PSM compares the outcome measures (e.g., being unemployed) of, for example, a 'treated' individual with a propensity score of 0.62 to a 'non-treated' individual with a propensity score of 0.61 (depending somewhat on the choice of bandwidth/caliper, see below). Obviously, this one-dimensionality implies that collinearity issues are nonexistent.

A logit model with polynomial terms for continuous variables is commonly used when estimating propensity scores[41]. As the goal is to calculate the probability of treatment assignment, it is only relevant to include (observable) variables known to be associated with unemployment/disability. We have chosen to report results derived from

kernel matching, but all analyses were run with the *nearest neighbor caliper* algorithm too. In kernel matching, all control respondents are used as matches, but each control subject is weighted according to how close his/her propensity score is to the treated individual. The bandwidth (0.02 in our case) determines how differences in propensity scores are translated into weights[42]. Higher bandwidth values lead to a smoother estimated density function, and thereby a better fit to the data, but this could come at the expense of increased bias. We chose a rather low bandwidth in order to keep bias at the minimum, but results were similar with higher bandwidth values (0.06, 0.10).

Note that there are some key differences between the OLS and PSM analysis in the current study. First, OLS is mainly used for descriptive purposes, whereas the PSM analysis is run in order to come closer to the establishment of a causal relationship (although far from ideally so, see below). Second, we use a smaller set of covariates in the OLS analysis, partly because of collinearity issues. Collinearity is not a problem in PSM, however, and it is therefore safe to include more covariates. This implies that the PSM analysis probably is much better able to deal with selection bias (i.e., omitted variable bias), at least compared with OLS. Third, the two analysis techniques differ in how variation in the data is weighted. PSM puts most weight on the (control) observations that are most likely to be treated, whereas OLS tries to minimize the squared errors and therefore puts more weight on (control) observations that are quite

dissimilar to the treated subjects[41]. Thus, results could differ extensively between OLS and PSM, even if the exact same covariates have been used.

The PSM analysis treats the data material as a pooled cross-section, although we follow people over time. However, since we include SRH health drop (within-individual deterioration in health) as a 'treatment', we incorporate a dynamic element in the analysis as well. The PSM procedure chosen here is preferable to individual level fixed effects because the latter method implies running the analysis on a small subsample (people who change status on both health and unemployment/disability). The overarching goal in this paper is to examine whether there is less labor market exclusion of people with ill health in Denmark and the Netherlands, compared to Norway and Belgium. It is therefore crucial to include as many individuals with bad (or deteriorating) health as possible in the analyses.

We use PSM in order to come closer towards the establishment of a (potential) causal relationship between health status and non-employment. It is therefore reassuring that there are no significant differences in education, age, gender, and marital status between 'treated' and 'control' subjects after matching (see table A10 in appendix). Consequently, the balancing procedure[vi] seems to have been successful. However, there could still be unobserved individual characteristics (for instance cognitive abilities or personality characteristics) omitted from the propensity score that are of importance for both health status and labor market outcomes. Thus, omitted variable bias is still a

major cause of concern, and matching methods cannot compensate for data insufficiencies (such as selective panel attrition or item non-response). Furthermore, the 'treatment' (bad/deteriorating health) is in our case very far from being randomly distributed, although one could argue that an unexpected drop in self-rated health is a 'health shock'[10]. Because of these uncertainties, we are reluctant to interpret the results from the subsequent PSM analysis as unbiased causal effects. However, PSM will probably deal more convincingly with selection bias than the OLS analysis is able to, which is why we believe it is valuable to present findings from both analysis techniques. We continue to the empirical results, starting with a presentation of descriptive statistics.

Empirical results

Descriptive statistics

Table 1 shows that the unemployment prevalence is highest in Belgium (7.53) and lowest in Norway (2.15). More surprising is the rather low unemployment prevalence in the Netherlands (2.83), especially in light of the economic downturn from 2011 and onwards (see figure A1). Thus, unemployed individuals are probably underrepresented in the Dutch sample. The disability prevalence ranges from 3.96 in the Netherlands to 5.87 in Norway. People report more LLSI in the Netherlands than Belgium, the opposite being the case for bad/fair health. The prevalence is higher in Denmark than in Norway

on both health measures. Educational qualifications are rather similar, with the exception of Belgium where more respondents have primary education. More old individuals (>50 years) are included in the Dutch (38.03) and Danish (45.48) samples. Lastly, people are married to a higher extent in Denmark (63.19) than in Norway (51.72).

The overarching pattern is that of similarity between the two 'country pairs', but there could still be important cross-national differences in observable characteristics for people reporting ill health (see table A4 in appendix). Overall, this is apparently not the case, although with four minor exceptions. First, people with LLSI report bad/fair health to a lesser extent in the Netherlands (66.42) than in Belgium (78.43). Second, low education is more common among people with LLSI in Belgium (42.87) than in the Netherlands (29.02). Third, people reporting LLSI are below 30 years of age to a larger degree in Norway (12.69), compared to Denmark (5.18). Fourth, those with LLSI are more often female in the Netherlands (64.19) compared to Belgium (55.82).

-- Table 1 and Figure 1 here --

Figure 1 shows the crude health inequalities in economic status (LLSI in panel A, bad/fair health in panel B). People with ill health are disabled to a larger, and employed to a lesser extent than people with good health status. The differences are also clear for unemployment. In Belgium, the unemployment prevalence is 12.3 percent for people with bad/fair health, and 6.34 for those with good health. The corresponding

numbers are 5.02 and 2.33 in the Netherlands, 4.37 and 1.62 in Norway, and 7.08 and 3.33 in Denmark. Hence, people with ill health are 'overrepresented' among the unemployed in all four countries.

Linear probability models

We proceed with the OLS analysis that provide descriptive evidence of unemployment and disability probability for people with health problems, after statistical adjustment for time trends (calendar year dummy variables) and a set of sociodemographic covariates (age, education, marital status, and gender). Recall that the perhaps main advantage with EU-SILC is the possibility for comparison of results between countries.

Unemployment probability for people with LLSI (panel A) and bad/fair health (panel B) is reported in table 2. The results are very similar without and with the covariates, and we will only comment on the 'fully adjusted' models. The unemployment probability for people with LLSI is higher in Belgium (0.032) than in the Netherlands (0.019), and higher in Denmark (0.025), compared to Norway (0.012). For people reporting bad/fair health, unemployment likelihood is somewhat lower in Norway (0.026) than in Denmark (0.032), and markedly lower in the Netherlands (0.024) than in and Belgium (0.049). Thus, there are noticeable cross-national differences in unemployment probability for people with ill health. However, there is no

consistent ‘flexicurity’ pattern, with the data showing less labor market exclusion of people with health problems in Norway and the Netherlands.

-- Tables 2 and 3 here --

Table 3 reports disability likelihood, where cross-national *similarities* are more pronounced. People with LLSI (panel A) have a 24.7 (Denmark), 27.6 (Norway), 16.6 (the Netherlands), and 23.1 (Belgium) percentage point higher likelihood of being disabled than people without LLSI. The results for bad/fair health (panel B) tell the same tale. The coefficient is 0.177 in Denmark, 0.203 in Norway, 0.159 in the Netherlands, and 0.165 in Belgium. Thus, the cross-national differences are rather minimal for disability probability.

The preceding analyses have also been stratified according to educational level, age, gender, and marital status (see tables A6 and A7 in appendix, only LLSI results shown). Overall, there are few differences between the two ‘country-pairs’, but some noteworthy exceptions appear. First, married individuals with LLSI have a comparatively high unemployment probability in the Netherlands. Second, young people with LLSI have a comparatively high unemployment probability in Norway. Third, women with LLSI have a comparatively high disability likelihood in Denmark. Fourth and lastly, married individuals with LLSI have a comparatively high disability likelihood in Norway.

We have also pooled the data for the Netherlands—Belgium and Denmark—Norway in order to see whether the cross-national differences are significant on conventional levels (see tables A8 and A9 in appendix, only LLSI results shown). People with LLSI are significantly less likely to be unemployed (-0.020) and disabled (-0.063) in the Netherlands, compared to Belgium, but the differences are quite small. The differences between Norway and Denmark are not statistically significant.

Propensity score matching

The preceding linear probability models (OLS) describes the overall health inequalities in non-employment. This is both interesting and policy-relevant information, but the OLS analysis is not well equipped to deal with omitted variable bias. It is therefore useful to supplement the OLS results with a statistical technique that is better able to adjust for selection bias, such as propensity score matching (PSM).

According to the PSM results, the cross-national similarities are even more pronounced (table 4). There is no significant relationship between LLSI and unemployment probability in any of the four countries after adjustment for selection bias through the matching procedure. On the other hand, people with LLSI have a higher disability likelihood, and the effect size varies from 0.142 (the Netherlands) to 0.194 (Belgium). The cross-national similarities are especially striking when we change treatment to *SRH health drop*: People who report deteriorating self-rated health are

2.3—2.6 percent more likely to report "disabled" as their economic status in the four countries. This similarity is quite remarkable, perhaps indicating that the social policy setting is inconsequential for people who experience a sudden drop in health: their health status is quite simply not compatible with employment anymore. The only noticeable cross-national difference is related to unemployment risk for people experiencing a drop in SRH, where the coefficient (0.015) is significant (on the 10 percent level) in Denmark, but not in the remaining countries.

-- Tables 4 and 5 here --

In table 5, the outcomes are changed to *becoming unemployed* and *becoming inactive*. Neither LLSI nor SRH health drop is significantly related to a heightened likelihood of becoming unemployed in the four countries. There is, however, some evidence suggesting that LLSI and SRH health drop are associated with a higher probability of becoming inactive in Belgium (and in Denmark for SRH health drop). Nonetheless, the main finding is that of cross-national similarity in table 5 as well.

Note that the LLSI—unemployment relationship was significant in all four countries in the OLS analyses, but insignificant throughout in the PSM analyses. This indicates that people with limiting longstanding illness tend to be disadvantaged on a range of personal characteristics (e.g., work experience and conscientiousness) of relevance for labor market exclusion that our 'simple' OLS model specification is unable to take into account. It is possible that the 'unemployment penalty' experienced

by people with bad health status arises from (unobserved) factors associated with health (e.g., previous unemployment spells or self-confidence), but not from the bad health *in itself*. In other words, the OLS results clearly demonstrates that people with ill health have a higher unemployment probability, whereas the PSM results indicates that this heightened unemployment risk is not due to the health problem *per se*, but rather caused by characteristics correlated with ill health. We continue with a discussion of the findings.

Discussion and conclusion

Health selection and social policy differences

The current paper has examined health selection to unemployment and disability in two archetypical 'flexicurity' countries (Denmark and the Netherlands) and two 'contrasting cases' (Norway and Belgium). According to the OLS analysis, the unemployment probability is somewhat lower among people with ill health in the Netherlands (vs. Belgium) and in Norway (vs. Denmark). In the OLS analysis of disability likelihood, on the other hand, the cross-national differences are less pronounced. In the PSM analysis, the cross-national differences in health selection proved to be negligible for both unemployment and disability.

Consequently, this study has revealed a clear, but somewhat surprising empirical pattern. Despite considerable differences in social policies between the four investigated countries, the results indicate that both unemployment and disability likelihood is remarkably similar for people with health problems. Thus, labor market exclusion (as indicated by unemployment and disability likelihood) is *not* less prevalent among people with ill health in the 'flexicurity' countries Denmark and the Netherlands, compared to Norway and Belgium.

Cross-national differences in *labor demand* might be an important biasing factor able to explain why people with ill health's employment outcomes do not vary as a function of labor market regulation. More specifically, the composition of the unemployed (and disabled) population changes as the economic conditions improve/deteriorate. This is probably not a major cause of concern for the comparison between Belgium and the Netherlands, as the difference in unemployment rate was merely circa 1.5 percentage points during 2010—2013. The differences were larger, however, between Denmark and Norway (roughly 4 percentage points), and unemployed and disabled people in Norway could therefore have a larger prevalence of (unobservable) health-related and social disadvantages than their Danish counterparts do. Accordingly, it is probably more difficult to incorporate the Norwegian unemployed/disabled into the labor market, at least compared to the situation in Denmark where the worse economic

conditions imply that more healthy and 'high skill' individuals experience labor market exclusion as well. Thus, it is conceivable that the Danish 'flexicurity' model would perform even worse compared to Norway if the economic conditions would have been similar in the two Scandinavian countries.

There are three **other** possible explanations for **the observed cross-national similarities**. First, different social policy combinations could lead towards the same results for the target group. Some of the cross-national policy differences go in opposing directions, and may therefore '*cancel each other out*' on average. In the case of Belgium—the Netherlands, differences in incapacity level, on the one hand, and permanency and activation, on the other, could explain why the results tend to converge. It is also important to stress the potential differences between 'flexicurity' policies "on paper" as opposed to "in practice". As mentioned above, the unemployment benefits are more generous in the 'contrasting case' of Norway, despite the fact that generous unemployment benefits are considered a cornerstone in the Danish 'flexicurity' labor market model. One could therefore argue that the discrepancies in social policies of relevance for labor market incorporation of people with ill health have been somewhat overstated in the existing 'flexicurity' literature. Nevertheless, some of the 'flexicurity' policies will most likely have tangible consequences for labor market attachment, such as the short notice periods (only 5-6 days at the extreme) for 'blue-collar' workers in Denmark[24].

Second, most policy instruments are located on the supply side, and *demand side reasons* for the observed 'employment penalty' are mostly neglected. Having ill health is an obvious risk factor from the employer's point of view, and most likely interpreted as a signal of low expected productivity. Hence, employers will often be skeptical towards – and might even be inclined to discriminate – people with health problems. If we are to advance in improving labor market outcomes for people with ill health, we have to devote more attention to the demand side. More widespread use of wage subsidizing, along with employment quotas for the disabled (as in France and Italy) could be an important first step in this regard.

Third and lastly, holding (full time) employment could simply be *too demanding* for a sizeable proportion of those who have poor health status. In fact, this could explain the striking cross-national similarity in the effect of a drop in self-rated health on disability likelihood, ranging from merely 2.3 to 2.6 percent (see table 4). When a person's health status deteriorates greatly, his/her condition is quite simply not compatible with wage labor anymore. Consequently, it does not matter how a country decides to structure its social policies and benefit systems, the person has to withdraw from the labor market. In these cases, the only thing that a welfare state can do is decide whether this labor market withdrawal should be accompanied by financial hardship (i.e., meager benefits), or continued social participation (i.e., more generous benefits).

In most of the models in the PSM analysis, people with ill health do not have a significantly higher unemployment likelihood. This result is, to some extent, at odds with previous research. For example, Reeves et al. [11] analyze EU-SILC data and find (see table 3, page 102) that people with ill health have a noticeably heightened unemployment likelihood. However, it is difficult to compare the current study and Reeves et al. [11] directly because both the sample inclusion criteria, the analysis technique (logistic multilevel vs. propensity score matching), and the operationalization of health status differs[vii] non-trivially.

There was one noticeable cross-national difference in the PSM analysis, namely a heightened unemployment risk for people experiencing a SRH health drop in Denmark (see table 4). The effect size is rather small (0.015), but the tendency is nonetheless worrying. This finding supports previous cross-national research showing that people with ill health have rather weak labor market attachment in Denmark[7,9]. Overall, this seems to suggest that the 'flexicurity' model in general – and weak employment protection in particular – could be damaging for people with poor or deteriorating health status. Before we conclude, several limitations in the current study should be recognized.

Limitations

The information is self-reported and hence prone to *response bias*. There is no reason to suspect, however, that this bias should differ systematically between the two 'country pairs'. A more important worry relates to *unit non-response* and *attrition*, for which there is no overall information available from Eurostat. It is highly likely that vulnerable groups (e.g., people with serious illnesses) are both (i) underrepresented in the samples, and (ii) more likely to drop out of the panel. The presented results could therefore be a 'lower bound' of the real-life association. Recall that the descriptive statistics indicated an *underrepresentation* of unemployed individuals in the Dutch sample. Thus, a potential downward bias might be particularly important for the Netherlands, especially if the most vulnerable unemployed are not covered. Furthermore, we believe that the 'becoming inactive' results can be interpreted as 'becoming disabled', but uncertainty remains due to the exact *questionnaire wording*.

There could still be important *personal characteristics omitted* (for instance cognitive abilities or personality) from the propensity score, and the PSM results cannot be interpreted as unbiased causal effects. Health problems are not assigned randomly, and people with ill health might differ non-trivially on both observable and unobservable characteristics of relevance for labor market exclusion. Choice of matching algorithm is apparently not decisive, however, as all the PSM analyses have been performed with nearest neighbor caliper matching (with replacement), yielding

very similar results (see table A11 and A12 in the appendix). There is also a risk of *reverse causality* here, i.e., that health status is poor because of the non-employment status[43]. We would need a longer and more balanced panel data set – in which the temporal order can be established – to rule this possibility out completely. Lastly, there might be *epidemiological differences* between the included countries, implying that health problems are – on average – of a worse kind in one or several of the countries. Unfortunately, it is difficult to know the severity of this bias due to the imprecise health information at our disposal.

Conclusion

This study has examined unemployment and disability likelihood in Denmark, Norway, the Netherlands, and Belgium in order to see whether the 'flexicurity' model is advantageous for people with ill health. The main finding is that of cross-national similarity, indicating that this is not the case. If 'flexicurity' policies were able to limit labor market exclusion for people with health problems, we would expect to see that reflected in the EU-SILC data. Other solutions are needed in order to improve labor market attachment for people with ill health. A first step is to put more emphasis on the demand side, which has received astonishingly little attention thus far. Both employment quotas and wage subsidies could be sensible policy instruments, and other creative solutions could appear in close collaboration with businesses. Finally, it is

important to stress that not everyone should be expected to participate on the labor market. Some people have such a bad health status that it is quite simply incompatible with wage labor, and other people's health status could deteriorate further due to the stress imposed by employment. In these cases, reasonably generous disability benefits is a much better option.

Notes

[i] The upper age limit is chosen because it is only from age 65 and onwards that retirement is more common than other economic status categories in all four countries in the current data.

[ii] Examples include cutting the vacation money for the unemployed and abolishing free physiotherapy for people with disabilities and chronic diseases.

[iii] This challenge arises because the coefficients are affected by the degree of unobserved heterogeneity in the model specification (due to the fixed variance of 3.29 in the logistic distribution).

[iv] Linear and logistic models yield very similar outcomes in significance testing, so the violation of the homoscedasticity assumption seems to have little practical importance.

[v] We prefer 'treatment' because it is the most common term in studies using propensity score matching. Note, however, that we do not consider bad or deteriorating health as a

treatment in the traditional sense, i.e. something that can be manipulated experimentally by a researcher.

[vi] We rely on two-sample t-test of equality in means. Standardized bias is an alternative procedure, which compares the distance between the marginal distributions: the difference in means between treated and control subjects as a percentage of the square root of the sample variance in both groups for covariate X. We prefer the t-test because it is easier to grasp.

[vii] First, the sample in Reeves et al.[11] only include people employed at baseline (i.e., in 2006/2008) who responded to three consecutive survey waves (i.e., a 'balanced panel'). Second, Reeves et al.[11] estimate an 'European average' by means of multilevel logistic regression model, whereas we run the analyses split by country. Third, Reeves et al.[11] use a different operationalization of health: we combine the two questions on chronic condition and health limitations (i.e., *limiting longstanding illness*), whereas they use the two questions separately. It is also important to note that figure 2 (see page 103) in Reeves et al.[11] shows that the health inequalities in job loss risk are modest for the Netherlands, Norway, and Denmark. However, for Belgium the health inequalities are quite pronounced.

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Tables

Table 1. Descriptive statistics, by country. Percent.

	Denmark	Norway	The Netherlands	Belgium
Unemployed	4.23	2.15***	2.83	7.53***
Disabled	5.73	5.87	3.96	4.26
LLSI	16.17	12.05***	18.71	14.12***
Bad/fair health	24.07	19.14***	18.36	19.94***
Educational level				
Primary educ.	17.67	18.47	21.51	27.04***
Secondary educ.	43.97	41.31***	41.68	36.69***
Higher educ.	38.36	40.23**	36.81	36.27
Age				
Young age (<30)	11.55	21.57***	16.28	23.33***
Prime age (30-50)	42.87	45.52***	45.69	44.56**
Old age (>50)	45.58	32.91***	38.03	32.11***
Woman	51.35	45.95***	53.35	51.47***
Married	63.19	46.96***	51.72	49.65***
N	6693	10 917	19 906	21 043
Notes	T-test on the difference in means between (i) Denmark and Norway, and (ii) the Netherlands and Belgium.			
	Significance levels: *** = 0.01 ** = 0.05 * = 0.1			

Table 2. Result from OLS regression of unemployment, by LLSI (panel A) or bad/fair health (panel B).

	Denmark		Norway		The Netherlands		Belgium	
Panel A	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
LLSI	0.030***	0.025**	0.013**	0.012**	0.021**	0.019**	0.045**	0.032**
	(0.010)	(0.010)	(0.006)	(0.006)	(0.004)	(0.004)	(0.008)	(0.008)
Covariates?	No	Yes	No	Yes	No	Yes	No	Yes
Individuals/ observations	2468/ 6647	2441/ 6577	4758/ 10898	4680/ 10754	8135/ 19886	8049/ 19684	9228/ 21035	9127/ 20795
Panel B								
Bad/fair health	0.037***	0.032**	0.028**	0.026**	0.027**	0.024**	0.060**	0.049**
	(0.008)	(0.008)	(0.005)	(0.006)	(0.004)	(0.004)	(0.007)	(0.007)
Covariates?	No	Yes	No	Yes	No	Yes	No	Yes
Individuals/ observations	2468/ 6647	2441/ 6577	4758/ 10898	4680/ 10754	8135/ 19886	8049/ 19684	9228/ 21035	9127/ 20795
Covariates	Woman, age, age squared, marital status, two educational level dummies.							
Notes	Significance levels: *** = 0.01 ** = 0.05 * = 0.1							
	Reported standard errors (in parentheses) clustered on individuals.							
	Calendar year dummy variables included in regressions.							

Table 3. Result from OLS regression of disability, by LLSI (panel A) or bad/fair health (panel B).

	Denmark		Norway		The Netherlands		Belgium	
Panel A	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
LLSI	0.263**	0.247**	0.302**	0.276**	0.179**	0.166**	0.246**	0.231**
	* (0.019)	* (0.019)	* (0.018)	* (0.017)	* (0.009)	* (0.009)	* (0.011)	* (0.011)
Covariates?	No	Yes	No	Yes	No	Yes	No	Yes
Individuals/	2468/	2441/	4758/	4680/	8135/	8049/	9228/	9127/
observations	6647	6577	10898	10754	19886	19684	21035	20795
Panel B								
Bad/fair	0.195**	0.177**	0.228**	0.203**	0.173**	0.159**	0.181**	0.165**
health	* (0.015)	* (0.014)	* (0.014)	* (0.013)	* (0.009)	* (0.009)	* (0.009)	* (0.008)
Covariates?	No	Yes	No	Yes	No	Yes	No	Yes
Individuals/	2468/	2441/	4758/	4680/	8135/	8049/	9228/	9127/
observations	6647	6577	10898	10754	19886	19684	21035	20795
Covariates	Woman, age, age squared, marital status, two educational level dummies.							
Notes	Significance levels: *** = 0.01 ** = 0.05 * = 0.1							
	Reported standard errors (in parentheses) clustered on individuals.							
	Calendar year dummy variables included in regressions.							

Table 4. Average treatment effect among the treated of (1) LLSI or (2) SRH health drop on unemployment or disability in Denmark, Norway, the Netherlands, and Belgium. Results from kernel matching.

	(1) LLSI		**(2) SRH health drop**	
	Outcome		Outcome	
	Unemployment	Disability	Unemployment	Disability
Denmark	0.012 (0.020)	0.180*** (0.030)	0.015* (0.008)	0.025*** (0.008)
Norway	-0.010 (0.012)	0.159*** (0.025)	-0.002 (0.004)	0.023*** (0.005)
The Netherlands	0.002 (0.010)	0.142*** (0.014)	-0.001 (0.003)	0.026*** (0.004)
Belgium	-0.005 (0.017)	0.194*** (0.014)	0.009 (0.005)	0.024*** (0.003)
Covariates	Two educational level dummies, five age dummies, gender, marital status, years in paid employment (and its square), part-time work, temporary work contract, self-employed, bad health, LLSI, three calendar year dummies.			
Notes	Significance levels: *** = 0.01 ** = 0.05 * = 0.1 Bootstrapped standard errors (100 replications) in parenthesis. Bandwidth = 0.02.			

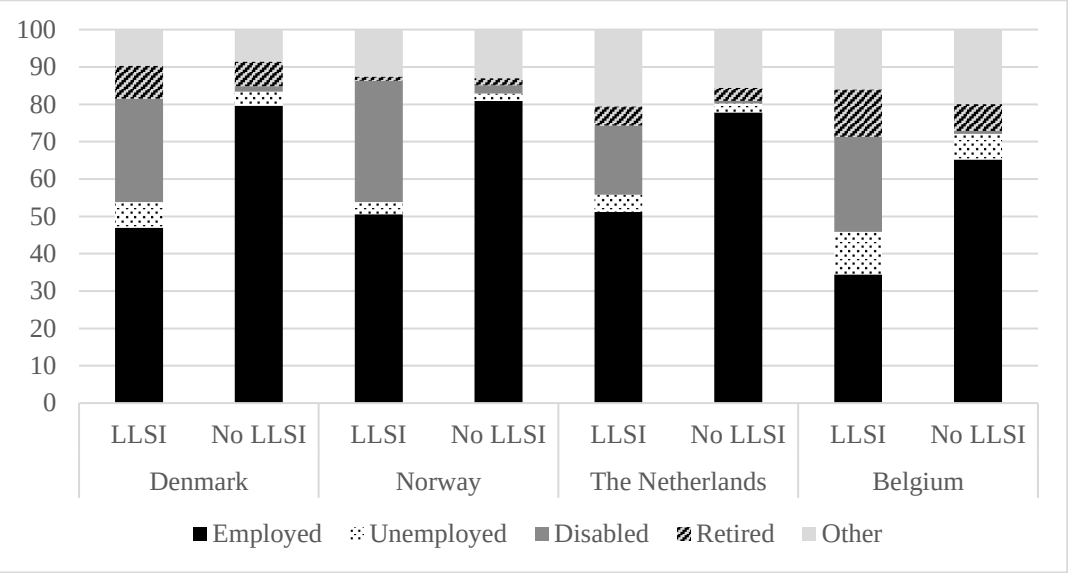
Table 5. Average treatment effect among the treated of (1) LLSI or (2) SRH health drop on becoming unemployed or inactive in Denmark, Norway, the Netherlands, and Belgium. Results from kernel matching.

	(1) LLSI		**(2) SRH health drop**	
	Outcome		Outcome	
	Becoming unemployed	Becoming inactive	Becoming unemployed	Becoming inactive
Denmark	-0.009 (0.013)	0.027*** (0.009)	-0.006 (0.005)	0.004 (0.006)
Norway	-0.007 (0.005)	0.007 (0.012)	-0.002 (0.002)	-0.003 (0.005)
The Netherlands	0.004 (0.004)	-0.020 (0.016)	-0.000 (0.002)	0.002 (0.003)
Belgium	-0.006 (0.006)	0.024** (0.010)	0.002 (0.003)	0.010*** (0.003)
Covariates	Two educational level dummies, five age dummies, gender, marital status, years in paid employment (and its square), part-time work, temporary work contract, self-employed, bad health, LLSI, three calendar year dummies.			
Notes	Significance levels: *** = 0.01 ** = 0.05 * = 0.1 Bootstrapped standard errors (100 replications) in parenthesis. Bandwidth = 0.02.			

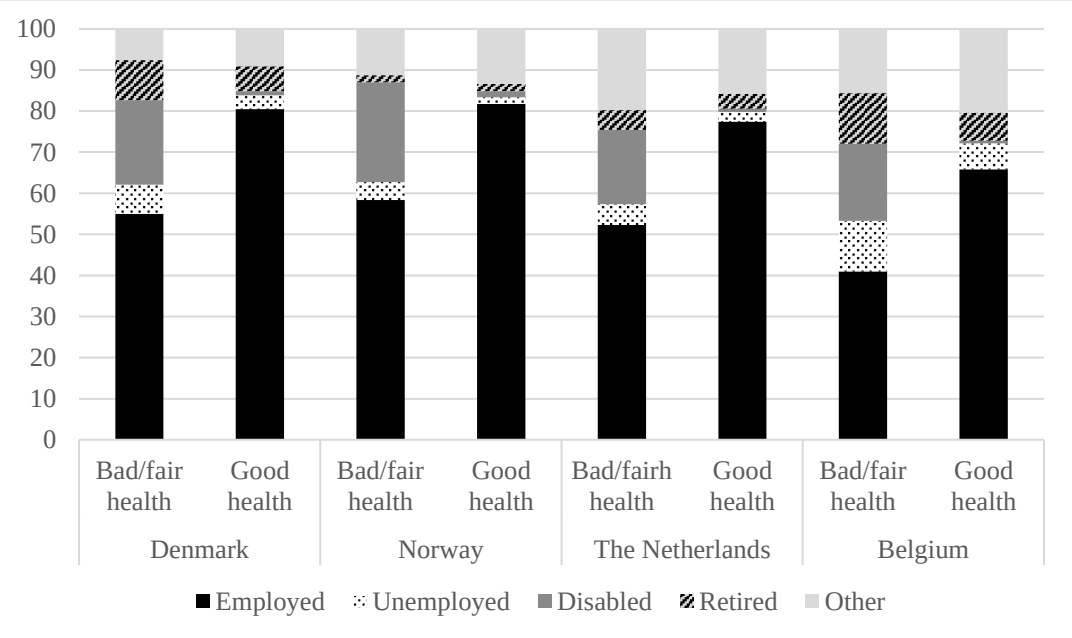
Figures

Figure 1. Economic status, by LLSI (panel a) or bad/fair health (panel b). Percent (see table A5 in appendix for detailed numbers).

Panel A. LLSI.



Panel B. Bad/fair health.



Appendix

Table A1. Summary of sickness insurance, activation programs, and employment protection legislation in Denmark, Norway, the Netherlands, and Belgium.

	Denmark	Norway	The Netherlands	Belgium
Sickness insurance	Universal &	Universal &	Social insurance	Social insurance
Type of sickness system	employment-related (social insurance)	social insurance		
Sickness generosity (2010 - 2011)	12.2–9.5	15.9–15.9	13.8–13.6	13.7–13.6
Replacement rate: Single	56.4–58.6		85.9–82.4	83.0–81.6
Replacement rate: Family	56.5–57.3		81.7–73.0	85.8–84.5
Qualification period (weeks)	13	4	0	26
Duration (weeks)	52	52	104	52
Waiting days	0	0	2	0
Coverage	100	100	100	100
Activation				
Tot. public expenditure on ALMP as % of GDP	3.70	1.10	2.56	2.94
Training	0.66	0.21	0.13	0.16
Employment incentives	0.31	0.11	0.02	0.19

Sheltered and supported employment and rehabilitation	0.65	0.17	0.45	0.13
Direct job creation	0.00	0.00	0.15	0.07
Counselor-to-jobseeker ratio	111.38	30.88	70.83	165.33
Employment Protection Legislation				
Strictness of employment protection regular contracts	2.13	2.33	2.82	2.08
Temporary contracts	1.38	3.00	0.94	2.38

Sources: [26,44-47]

Table A2. Summary of disability policies in Denmark, Norway, the Netherlands, and Belgium.

	Denmark	Norway	The Netherlands	Belgium
Disability				
Type of model	Social Democratic	Social Democratic	Social Democratic	Corporatist
Compensation index	28	33	24	25
Eligibility criteria in terms of	a reduction in work capacity	a reduction in work capacity	a reduction in earning capacity	a reduction in earning capacity
% Expenditure/ GDP	4.841	4.253	3.315	2.519
Minimum level of incapacity	50%	50-40%	35%	66%
Qualifying period	At least 3 years of residence between the age of 15 and 65.	3 years of insurance immediately prior to the disability.	No minimum period.	120 working days of assimilated in the course of the 6 months prior to the incapacity.
Permanent/temporary retesting	Permanent if rehabilitation failed (no re-test)	Permanent if rehabilitation failed (no re-test)	Permanent payment for full & permanent disability. Temporary (5 years) for partial or temporary disability.	Granted indefinitely, with flexible examinations, after 3 year permanent
Integration index‡	37	37	35	26
Preferential employment of persons with disabilities	No quota	No quota	No provisions/quota	No provisions/quota

	Public authorities have to give preference to disabled persons. The local authorities provide subsidies to the employers offering a job to the disabled.	Where appropriate, salaried retraining can take place with the regular employer or in sheltered workshops.		
Rehabilitation, retraining	Assistance for special medical care; Maintenance allowances during vocational rehabilitation; Assistance supplied by local authorities	It is a condition for disability benefit that appropriate rehabilitation has been tried. Rehabilitation measures can be education, vocational training courses, help to start a business, subsidized retraining within the enterprise or at a sheltered workshop. The person must accept retraining to another profession where this is considered appropriate. During the rehabilitation a vocational Work Assessment Allowance is	Employers who hire a person receiving a disability benefit can receive compensation for wage costs in case of sickness Job assistance facilities can be given to a beneficiary who finds work. Personal coaching on the job is especially important for the young. The maximum period of the so-called work on trial is prolonged from 3 to 6 months. During the work on trial the	Functional and occupational retraining, in accordance with decision of panel of doctors, in specialized establishments.

		paid when the sickness cash benefit has expired.	beneficiary can work with full pay of the benefit.	
% spending ALMP for disabled of tot. spending disability	>10%	>10%	>10%	<10%
Partial disability system	flex-jobs: wage subsidy scheme (cover the full difference between the previous & new wage)	Partial disability system	Wage supplement depending on the amount of remaining work capacity	Partial disability system

Sources: [44, 48]

‡The integration index distinguishes the following ten sub-dimensions: (i) Coverage consistency (access to different programs and possibility to combine them). (ii) Assessment structure (responsibility and consistency). (iii) Anti-discrimination legislation covering employer responsibility for work retention and accommodation. (iv) Supported employment program (extent, permanence and flexibility). (v) Subsidized employment program (extent, permanence and flexibility). (vi) Sheltered employment sector (extent and transitory nature). (vii) Vocational rehabilitation program (obligation and extent of spending). (viii) Timing of rehabilitation (from early intervention to late intervention only for disability benefit recipients). (ix) Benefit suspension regulations (from considerable duration to nonexistent). (x) Additional work incentives (including possibilities to combine work and benefit receipt).

Table A3. Summary of unemployment policies in Denmark, Norway, the Netherlands, and Belgium.

	Denmark	Norway	The Netherlands	Belgium
Type of system	Subsidized voluntary insurance	Universal & Social insurance	Social insurance & social assistance	Social insurance
Unemployment generosity‡ (2010 & 2011)	9.4–9.5	14.2–13.9	11.9–11.7	14.0–13.8
Replacement rate: Single (%)	56.4–58.6	66.8–66.5	83.0–80.4	67.3–66.8
Replacement rate: Family (%)	58.8–57.3	72.3–71.7	81.7–78.3	73.6–73.1
Qualification period (weeks)	52	4	104	78
Duration (weeks)	52	104	90	Unlimited
Waiting days	0	3	0	0
Coverage (%)	71	92	86	86
Expenditure (% of GDP)	2.283	0.489	1.453	3.508

Means test	No means test.	No means test.	No means test.	No means test.
Conditions				
voluntary/involuntary	(In)voluntary unemployment	(In)voluntary unemployment	Involuntary unemployment	Involuntary unemployment
Job search requirements (0-5)	1.00	2.00	5.00	2.00
Work-availability criteria (0-5)	4.25	5.00	4.00	2.75
Eligibility criteria	1.00	0.04	0.15	0.50
Sanctions	2.00	2.33	5.00	3.00

Sources: [26,27,44,45,49]

‡The measurements is a combination of five indicators: The generosity of benefits paid to the unemployed (replacement rate), the qualifying period as a condition, the duration of benefit payments, the waiting period before entitlement is available, and the percentage of the working-age population covered by the program. The higher the benefits, the duration of the benefits, and the coverage, and the shorter the qualifying period and waiting time, the more generous the unemployment benefits.

Table A4. Descriptive statistics for people reporting LLSI, by country. Percent.

	Denmark	Norway	The Netherlands	Belgium
Unemployed	6.82	3.28***	4.57	11.41***
Disabled	27.73	32.42**	18.51	25.42***
Bad/fair health	76.89	73.40**	66.42	78.43***
Educational level				
Primary educ.	22.34	25.96**	29.02	42.87***
Secondary educ.	45.05	48.85*	42.93	33.77***
Higher educ.	32.62	25.19***	28.05	23.37***
Age				
Young age (<30)	5.18	12.69***	8.62	8.51
Prime age (30-50)	38.72	41.49	37.45	39.06
Old age (>50)	56.10	45.82***	53.93	52.42
Woman	59.15	58.81	64.19	55.82***
Married	62.75	46.16***	49.37	53.26***
N	1082	1316	3725	2972
Notes	T-test on the difference in means between (i) Denmark and Norway, and (ii) the Netherlands and Belgium.			
	Significance levels: *** = 0.01 ** = 0.05 * = 0.1			

Table A5. Economic status, by LLSI (panel a) or bad/fair health (panel b). Percent.

	Denmark		Norway		The Netherlands		Belgium	
A. LLSI	(1) LLSI	(2) No LLSI	(1) LLSI	(2) No LLSI	(1) LLSI	(2) No LLSI	(1) LLSI	(2) No LLSI
Employed	46.97	79.64 ***	50.57	80.91 ***	51.20	77.82 ***	34.44	65.19 ***
Unemployed	6.82	3.73 ***	3.28	1.99 ***	4.57	2.42 ***	11.41	6.89 ***
Disabled	27.73	1.51 ***	32.42	2.24 ***	18.51	0.62 ***	25.42	0.79 ***
Retired	8.78	6.60**	1.14	1.83*	5.19	3.53 ***	12.73	7.16 ***
Other†	9.71	8.52	12.59	13.03	20.53	15.62 ***	15.99	19.97 ***
N	1071	5576	1311	9587	3717	16169	2970	18065
B. Bad/fair health	(1) Bad/ fair health	(2) Good health	(1) Bad/ fair health	(2) Good health	(1) Bad/ fair health	(2) Good health	(1) Bad/ fair health	(2) Good health
Employed	55.01	80.50 ***	58.34	81.73 ***	52.29	77.46 ***	41.00	65.80 ***
Unemployed	7.08	3.33 ***	4.37	1.62 ***	5.02	2.33 ***	12.30	6.34 ***
Disabled	20.55	1.05 ***	24.32	1.52 ***	18.10	0.79 ***	18.74	0.66 ***
Retired	9.77	6.06 ***	1.73	1.75	4.85	3.61 ***	12.30	6.86 ***
Other†	7.58	9.07*	11.24	13.38 ***	19.74	15.81 ***	15.66	20.34 ***
N	1596	5051	2081	8817	3647	16239	4195	16840

Notes † = Student, homemaker, in military service, or inactive.

T-test between (i) LLSI and no LLSI, and (ii) bad/fair health and good health within each country.

Significance levels: *** = 0.01 ** = 0.05 * = 0.1

Table A6. Result from OLS regression of unemployment, by LLSI, educational level, and LLSI X educational level (panel a), LLSI, age, and LLSI X age (panel b), LLSI, gender, and LLSI X gender (panel c), or LLSI, marital status and LLSI X marital status (panel d).

	Denmark	Norway	The Netherlands	Belgium
Panel A. Educational level (ref.: higher education)				
LLSI	0.017 (0.016)	0.020* (0.011)	0.023*** (0.008)	0.033** (0.013)
Primary education X LLSI	-0.000 (0.025)	-0.018 (0.018)	-0.020* (0.011)	0.004 (0.019)
Secondary education X LLSI	0.018 (0.022)	-0.012 (0.013)	0.008 (0.010)	0.000 (0.018)
Panel B. Age (ref.: 30-50 years)				
LLSI	0.034** (0.016)	0.017** (0.009)	0.028*** (0.007)	0.072*** (0.013)
Young age X LLSI	0.013 (0.045)	0.055** (0.027)	0.002 (0.016)	-0.037 (0.025)
Old age X LLSI	-0.008 (0.021)	-0.020** (0.010)	-0.015* (0.009)	-0.043** (0.017)
Panel C. Gender (ref.: men)				
LLSI	0.032** (0.016)	0.021** (0.10)	0.024*** (0.007)	0.040*** (0.012)
Woman X LLSI	-0.003 (0.021)	-0.011 (0.012)	-0.003 (0.009)	0.010 (0.016)
Panel D. Marital status (ref.: unmarried)				
LLSI	0.018 (0.017)	0.022** (0.009)	0.030*** (0.007)	0.047*** (0.012)
Married X LLSI	0.020 (0.021)	-0.020* (0.011)	-0.018** (0.008)	0.000 (0.016)
Individuals	2441	4680	8049	9179
Observations	6577	10 756	19 684	20 885
Significance level	*** = 0.01 ** = 0.05 * = 0.1			
Notes	Reported standard errors (in parentheses) are clustered on individuals. Only the health coefficient and the interaction terms (health X covariate) is presented. Full models available on request. Calendar year dummy variables included in regressions.			

The number of individuals/observations refer to the educational level models. The numbers are slightly higher in the remaining model specifications.

Table A7. Result from OLS regression of disability, by LLSI, educational level, and LLSI X educational level (panel a), LLSI, age, and LLSI X age (panel b), LLSI, gender, and LLSI X gender (panel c), or LLSI, marital status and LLSI X marital status (panel d).

	Denmark	Norway	The Netherlands	Belgium
Panel A. Educational level (ref.: higher education)				
LLSI	0.196*** (0.032)	0.183*** (0.030)	0.109*** (0.014)	0.138*** (0.018)
Primary education X LLSI	0.202*** (0.054)	0.219*** (0.047)	0.134*** (0.023)	0.144*** (0.026)
Secondary education X LLSI	0.043 (0.042)	0.123*** (0.039)	0.070*** (0.020)	0.128*** (0.026)
Panel B. Age (ref.: 30-50 years)				
LLSI	0.230*** (0.029)	0.233*** (0.025)	0.159*** (0.014)	0.240*** (0.017)
Young age X LLSI	-0.201*** (0.038)	-0.159*** (0.035)	-0.098*** (0.021)	-0.131*** (0.032)
Old age X LLSI	0.073* (0.039)	0.176*** (0.037)	0.050*** (0.019)	0.028 (0.023)
Panel C. Gender (ref.: men)				
LLSI	0.221*** (0.029)	0.310*** (0.028)	0.181*** (0.016)	0.268*** (0.018)
Woman X LLSI	0.069* (0.039)	-0.016 (0.036)	-0.003 (0.019)	-0.038* (0.023)
Panel D. Marital status (ref.: unmarried)				
LLSI	0.290 (0.032)	0.274*** (0.022)	0.214*** (0.014)	0.269*** (0.017)
Married X LLSI	-0.044 (0.040)	0.060* (0.035)	-0.070*** (0.018)	-0.043* (0.022)
Individuals	2441	4680	8049	9179
Observations	6577	10 756	19 684	20 885
Significance level	*** = 0.01 ** = 0.05 * = 0.1			
Notes	Reported standard errors (in parentheses) are clustered on individuals. Only the health coefficient and the interaction terms (health X covariate) is presented. Full models available on request. Calendar year dummy variables included in regressions.			

The number of individuals/observations refer to the educational level models. The numbers are slightly higher in the remaining model specifications.

Table A8. Result from OLS regression of unemployment (panel A) or disability (panel B), by LLSI, the Netherlands, and the Netherlands X LLSI.

Panel A: Unemployment		
(ref.: Belgium)	(1)	(2)
LLSI	0.045*** (0.008)	0.037*** (0.008)
The Netherlands	-0.045*** (0.003)	-0.044*** (0.003)
The Netherlands x LLSI	-0.024*** (0.009)	-0.020** (0.009)
Covariates?	No	Yes
Individuals/observations	17 363/ 40 921	17 176/ 40 479
Panel B: Disability		
(ref.: Belgium)	(1)	(2)
LLSI	0.246*** (0.011)	0.230*** (0.011)
The Netherlands	-0.002 (0.001)	-0.003*** (0.001)
The Netherlands x LLSI	-0.067*** (0.015)	-0.063*** (0.014)
Covariates?	No	Yes
Individuals/observations	17 363/ 40 921	17 176/ 40 479
Covariates	Woman, age, age squared, marital status, two educational level dummies.	
Notes	Significance levels: *** = 0.01 ** = 0.05 * = 0.1	
	Reported standard errors (in parentheses) are clustered on individuals.	
	Calendar year dummy variables included in regressions.	

Table A9. Result from OLS regression of unemployment (panel A) or disability (panel B), by LLSI, Denmark, and Denmark X LLSI.

Panel A: Unemployment (ref.: Norway)	(1)	(2)
LLSI	0.013** (0.006)	0.011* (0.006)
Denmark	0.017*** (0.003)	0.020*** (0.004)
Denmark x LLSI	0.017 (0.012)	0.015 (0.011)
Covariates?	No	Yes
Individuals/observations	7226/ 17545	7121/ 17331
Panel B: Disability (ref.: Norway)	(1)	(2)
LLSI	0.301*** (0.018)	0.278*** (0.017)
Denmark	-0.006** (0.003)	-0.018*** (0.004)
Denmark x LLSI	-0.039 (0.026)	-0.035 (0.026)
Covariates?	No	Yes
Individuals/observations	7226/ 17545	7121/ 17331

Covariates Woman, age, age squared, marital status, two educational level dummies.

Notes Significance levels: *** = 0.01 ** = 0.05 * = 0.1

Reported standard errors (in parentheses) are clustered on individuals.

Calendar year dummy variables included in regressions.

Table A10. Covariate balancing, derived from kernel matching (treatment = SRH health drop, outcome = being unemployed).

	Denmark		**Norway**		**The Netherlands**		**Belgium**	
	Treated	Control	Treated	Control	Treated	Control	Treated	Control
Education								
Primary	12.26	12.57	16.78	17.56	20.92	19.36	24.11	23.21
Secondary	47.76	47.45	44.30	42.79	39.91	39.96	37.33	37.57
Higher	39.98	39.99	38.93	39.65	39.17	40.68	38.56	39.23
Age								
Young (<30)	6.83	7.47	20.29	21.04	7.63	7.64	10.49	11.18
Prime (30-50)	45.33	47.15	45.76	43.74	52.95	52.39	53.06	52.69
Old (>50)	47.84	45.38	33.95	35.22	39.42	39.96	36.44	36.13
Woman	59.39	58.83	43.65	43.65	52.23	52.16	48.31	48.48
Married	66.85	65.62	46.16	46.00	57.27	57.02	56.41	56.61

Notes T-test on the difference between treated and control subjects.

Significance levels: *** = 0.01 ** = 0.05 * = 0.1

Table A11. Robustness check. Average treatment effect among the treated of (1) LLSI or (2) SRH health drop on unemployment or disability in Denmark, Norway, the Netherlands, and Belgium. Results from nearest neighbor caliper matching.

	(1) LLSI		**(2) SRH health drop**	
	Outcome		Outcome	
	Unemployment	Disability	Unemployment	Disability
Denmark	0.019 (0.016)	0.175*** (0.018)	0.016** (0.008)	0.027*** (0.008)
Norway	-0.013 (0.009)	0.178*** (0.018)	-0.005 (0.004)	0.026*** (0.007)
The Netherlands	0.004 (0.009)	0.147*** (0.009)	-0.003 (0.003)	0.025*** (0.004)
Belgium	-0.012 (0.014)	0.197*** (0.011)	0.012** (0.006)	0.025*** (0.004)
Covariates	Two educational level dummies, five age dummies, gender, marital status, years in paid employment (and its square), part-time work, temporary work contract, self-employed, bad health, LLSI, three calendar year dummies.			
Notes	Significance levels: *** = 0.01 ** = 0.05 * = 0.1 Each treated subject matched to four controls. Caliper = 0.01 Matching performed with replacement.			

Table A12. Robustness check. Average treatment effect among the treated of (1) LLSI or (2) SRH health drop on becoming unemployed or inactive in Denmark, Norway, the Netherlands, and Belgium. Results from nearest neighbor caliper matching.

	(1) LLSI		**(2) SRH health drop**	
	Outcome		Outcome	
	Becoming unemployed	Becoming inactive	Becoming unemployed	Becoming inactive
Denmark	-0.006 (0.012)	0.029** (0.013)	-0.005 (0.006)	0.003 (0.006)
Norway	-0.006 (0.006)	0.005 (0.013)	-0.002 (0.002)	-0.004 (0.006)
The Netherlands	0.005 (0.006)	-0.022** (0.009)	-0.001 (0.003)	0.005 (0.003)
Belgium	-0.007 (0.006)	0.024*** (0.006)	0.003 (0.003)	0.009*** (0.003)
Covariates	Two educational level dummies, five age dummies, gender, marital status, years in paid employment (and its square), part-time work, temporary work contract, self-employed, bad health, LLSI, three calendar year dummies.			
Notes	Significance levels: *** = 0.01 ** = 0.05 * = 0.1 Each treated subject matched to four controls. Caliper = 0.01 Matching performed with replacement.			

Figure A1. Unemployment rates from 2006 to 2015 in Denmark, Norway, the Netherlands, and Belgium (age: 20—64 years). Source: [50]