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IZA DP No. 15645

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Petri Böckerman
University of Jyväskylä, LABORE and IZA

Mika Haapanen
University of Jyväskylä

Edvard Johansson
Åbo Akademi University

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ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Lost Mind, Lost Job? Unequal Effects of Corporate Downsizings on Employees*

We analyze whether employees with diagnosed mental health disorders have a higher probability of being laid off during corporate downsizing. Our analysis is based on nationwide administrative data on all private sector firms and their employees in Finland over the period 2005–2017. We focus on firms with at least 20 employees that lay off at least 20% of their total workforce between two consecutive years. We estimate whether those who have been laid off have more diagnosed mental health disorders before downsizing happens than those who have not been laid off. In our baseline specification, controlling for a rich set of employee characteristics, we find that having had any mental health disorder diagnosis in the three years that preceded the downsizing increases the probability that an employee is laid off by 6 percentage points. The results highlight that those with underlying mental health disorders are more vulnerable to losing their jobs, even in the event of a mass layoff.

JEL Classification: I10, I12, J64

Keywords: unemployment, health, mental heath, job displacement, corporate downsizing, mass layoff

Corresponding author:
Petri Böckerman
Labour Institute for Economic Research
Pitkänsillanranta 3A
FI-00530 Helsinki
Finland

E-mail: petri.bockerman@labour.fi

* This study is part of a project supported by OP Group Research Foundation. We thank seminar participants at the Annual Conference of the European Association of Labour Economists (2022), Labour Institute for Economic Research LABORE, University of Jyväskylä, and University of Turku for their helpful comments.

1. Introduction

Modern labor markets are characterized by incessant turbulence. Extensive empirical literature examines what happens to an individual's health after a firm closes or downsizes (Böckerman & Ilmakunnas 2009, Black et al. 2015, Browning & Heinesen 2012, Browning et al. 2006, Eliason & Storrie 2009). Within this literature, there are also studies that explicitly focus on mental health effects (Farré et al. 2018, Eliason & Storrie 2010, Bach et al. 2021). This research points to a causal effect of unemployment on health problems for individual employees.

This research has a broader societal interest because firm closures or corporate downsizings, however, are a necessary part of creative destruction and subsequent productivity gains but can be painful in terms of economic and non-economic consequences for those who are laid off. From a methodological point of view, these studies are based on a valid research design, as a large corporate downsizing is an exogenous shock to the individual employee, and therefore, we can be more certain that the individual-level effects found after downsizing are plausibly caused by downsizing and not the other way around, or that some third confounding factor is causing health problems and the incidence of unemployment. Moreover, a large body of literature documents that those who are not laid off but are left in the shrinking firm after downsizing tend to suffer from pronounced mental health disorders due to work-related stress and increased perceived job insecurity (Kivimäki et al. 2000, Vahtera et al. 2004, Vahtera et al. 1997).

Much less attention has been directed at what goes on before downsizing occurs; that is, are employees with diagnosed mental health disorders more likely to be laid off in a mass downsizing? This is an important issue because, in most countries, it is illegal to prioritize healthy workers at the onset of a mass layoff. For example, in Finland, according to binding collective labor agreements, it is not allowed apart from very severe cases. Finnish legal practice has confirmed that these severe cases are situations in which the employee has been absent from

work for more than 40–50% of working days, which is extremely rare in practical settings. In terms of research on this question, evidence was found by Andreeva et al. (2015), who, using a relatively small sample of Swedish workers, report that women with major depression have elevated risks of exclusion from employment when organizations downsize, whereas for men, job loss is not significantly influenced by their health status. Another strand of literature, which is partly related, deals with purchases of psychotropic drugs (Blomqvist et al. 2018, Kaspersen et al. 2016, Magnusson Hansson et al. 2016). In this literature, large cohorts of individuals are followed over time, and importantly, for our purposes, it is investigated whether those who will encounter a layoff in the future are more likely to have purchased psychotropic drugs before that happens. The main conclusion from these studies is that purchases of drugs increase before downsizing for those who are later laid off. These effects are plausibly explained by anticipation effects.

Although studies using purchases of psychotropic drugs shed some light on potential selection in terms of mental health in the situation of mass layoffs, these studies provide only partial evidence of the relationship between poor mental health and the probability of being laid off in a mass layoff. Therefore, in this paper, we improve upon previous empirical research by using information about employees' actual mental health disorder diagnoses. The analysis is based on data on all private sector establishments and their employees in Finland between 2004 and 2017.[1] We investigate firms with at least 20 employees who lay off at least 20% (or 30% in robustness checks) of their total workforce between two years. We then compare employees from the same firms who were laid off with employees who were not laid off and analyze

[1] An establishment/plant is defined by Statistics Finland as a local kind-of-activity unit. It is a specific physical location, which is specialized in the production of certain types of products or services. Because most firms have only one establishment/plant, we use in this paper the terms "establishment" and "firm" interchangingly. For clarity, strictly in the context of our data we use the term "establishment".

whether those who were laid off had more mental health disorder diagnoses before the downsizing happened than those who were not laid off.

Our results show that previous mental health status has a meaningful impact on the likelihood of losing a job during a mass layoff. Having had any mental health disorder diagnosis in the three years that precede a layoff increases the probability that an employee will be laid off by 6 percentage points, according to our baseline specification. We also investigate various types of mental health disorder diagnoses and find that the two most important types of mental health disorder diagnoses are depression and substance use disorder. In the models, we control for a rich set of potential confounders, such as employee demographic characteristics, the average earnings of the employee during the three years before the layoff, and the employee's general health condition, measured by the number of sick days during the pre-displacement period. The models also include the full set of firm fixed effects that account for time-invariant employer characteristics.

2. Data

The linked data used in this paper are a combination of data from several administrative registers in Finland. First, we use linked employee–employer data from Statistics Finland. These data have been extensively used in labor market research in economics in the past (Huttunen & Kellokumpu 2016). The subset of data we use contains information on every private sector establishment and their employees in Finland for the years 2005–2017.

The employee–employer data are linked to comprehensive information recording mental health disorders. Our main source for health information is the Finnish Hospital Discharge Register (HDR), which is compiled by the National Institute for Health and Welfare from 1969 to 2017. The data include information on the dates of admission to the hospital, dates of discharge, and

the primary reason for hospitalization. Mental health disorders correspond to diagnostic codes, starting with the letter F in the International Statistical Classification of Diseases and Related Health Problems (ICD)-10 classification (and 290–319 in ICD-8 or 9). Validation studies have confirmed that the HDR is of high quality from 1972 onward (Sund 2012). Appendix A contains supplementary information regarding the Finnish healthcare system.

To measure medical absenteeism from work, we use the total data on medical leaves and sick days over the period 1998–2017. The comprehensive register-based data are from the Social Insurance Institution of Finland (Kela). The information that we use is derived from the database used to pay medical benefits to affected individuals. Before receiving any medical benefits from Kela, an employee must complete a nine-day waiting period. The incapacity to work must be certified by a physician (i.e., general physicians, occupational physicians, and psychiatrists), and the employer is obliged to notify Kela of the medical leave. Employees are entitled to normal full salaries during the nine-day waiting period (for a detailed description of the Finnish medical insurance system, see Böckerman et al. 2018). Thus, due to the characteristics of the benefits system, the data recorded by Kela contain medical leave periods lasting longer than nine days.

3. Empirical approach

3.1 Sample construction

We select establishments from the private sector of the Finnish economy and examine displacements that take place over the period 2004–2017. Following previous research (Black et al. 2015), we first define a base year, which constitutes all the years between 2004 and 2016.

The sample consists of employees for whom three conditions are met. First, the establishment at which the employee was working at time *b* decreased the number of persons employed by at

least 20% between b and $b+1$.[2] Second, the establishment had at least 20 persons employed at time b. Third, the establishment has a positive number of persons employed at time $b+1$.

We then divide these employees into a treatment group and a comparison group. The treatment group consists of workers who are either unemployed or working at another establishment at time $b+1$ compared to at time b. The comparison group consists of all workers who are employed in the same establishment at times b and $b+1$. This setup is a variant of similar research designs in studies on the effects of company shutdowns on various outcomes (Huttunen & Kellokumpu 2016). Thus, the sample includes only individuals who worked at companies that experienced substantial downsizing between b and $b+1$, and we compare those who were displaced with those who were not displaced in those organizations. Consequently, organizations that shut down altogether or did not downsize are excluded from the study sample.

We impose additional restrictions on the sample we use to analyze the effects. First, we exclude public sector workers because their establishment codes are not well-defined by Statistics Finland. This implies that the analyses focus on the private business sector. Second, we exclude wage and salary earners over the age of 59, as the analysis may otherwise be affected by retirement decisions (Hakola & Uusitalo 2005).

3.2 Econometric specifications

Using our data, we estimate fixed effects linear probability models of the following type:

$$E_{ij,b+1} = \alpha H_i + \beta X_{ib} + \gamma_b + \delta_j + \varepsilon_{ijb}, \quad (1)$$

where $E_{ij,b+1}$ is a dummy variable taking the value of 1 if individual i is not employed in the same establishment j at b and $b+1$, and 0 otherwise. H_i is an indicator variable that takes the

[2] Employment status and employer is measured during the last week of each year.

value of 1 if the individual has had any diagnoses of mental health disorders between b and $b-3$. X_{ib} is a vector of the pre-displacement characteristics of the individual, including age dummies, gender, education, sick days between $b-3$ and b, and the average earnings between $b-3$ and b. Earnings are deflated using the consumer price index, with 2015 as the base year. Finally, γ_b is a set of base year dummies, δ_j represents firm fixed effects, and ε_{ijb} is an error term. To avoid an employee being included twice in the data (i.e., was laid off more than once), we use only the first instance in which an employee is displaced. The reason for this is that previous displacement may affect later mental health, which, in turn, may affect later employment and the probability of being laid off at another time. This restriction is the same as, for example, in Huttunen and Kellokumpu (2016).

Our interest is in the indicator variable H_i, of which the corresponding parameter α gives the magnitude of the effect of having a mental health disorder diagnosis during $b-3$ and b on the probability of being displaced between b and $b+1$.

In the main models, we include only individuals who were employed in the establishment under consideration during all years between $b-3$ and b. The reason for this is that individuals with previous mental health disorder diagnoses may have a more unstable work history than individuals without mental health disorder diagnoses (Bartel & Taubman 1986). In a robustness check, we also include in the treated group those who left the establishment between $b-1$ and b, the so-called "early leavers" (Schwerdt 2011).

Before turning to the results, we provide additional explanations for the control variables used in equation (1). We include a control for the number of sick days other than for mental health disorders per year that an employee has had. There are two reasons for this. First, as explained in the introduction, very long medical leaves from work are a valid reason for dismissal from a job; therefore, it is necessary to control for that. Second, sick days are a measure of the overall

health of an employee, which may correlate with mental health status. This was also found in previous literature (Sareen et al. 2006). Thus, if previous medical leave is not included, the results on the effect of mental health on being laid off may be overstated, as they may hide the effect of other health problems.

We also include the log of average earnings among the control variables. This is because earnings are a proxy for employee productivity, which may negatively affect the probability that an employee will be dismissed in a mass layoff.

Moreover, we include controls for employees' education levels. Education (as a key measure of human capital) correlates with earnings or, otherwise, with job tasks or position in the firm, which may affect the probability of being laid off in a mass layoff (Beuermann et al. 2021).

The log of the size of the establishment is also included to control for potential non-linear effects in the growth and reductions in the workforce based due to establishment size. It is possible that smaller firms, in relative terms, grow quicker but also shrink quicker than larger firms, which would affect a random employee's probability of being laid off.

The regressions also include a full set of (base) year dummies, age dummies, and an indicator for being female. In all of the regressions, we also use a full set of firm fixed effects that account for time-invariant employer characteristics.

4. Results

4.1 Descriptive evidence

Table 1 presents an overview of all individuals in Finland, based on their mental health status over the period 1998–2017. Descriptive statistics are based on panel data so that an observational unit is a person-year. Columns 1 and 2 include all individuals, not only wage and

salary earners. It is clear that those with mental health conditions fare much worse than those without them, which is very much in accordance with previous research (Biasi et al. 2021). The average earnings, for instance, are less than 50% for those with a mental health disorder diagnosis, and the probability of being employed is also less than 50% for those who do not have a diagnosis. The number of sick days is also much higher, on average, for those with a mental health disorder diagnosis than for those without. It is also evident that the employment history of those with a mental health disorder diagnosis is more unstable than that of those without one. The data show that only 14% of those with a mental health disorder diagnosis have been working, whereas the corresponding figure for those without a diagnosis is 26%.

[TABLE 1 AROUND HERE]

In columns 3 and 4, the sample is narrowed to only individuals who work during the year. Earnings are now much higher than in columns 1 and 2, but there is still a large gap between those with a mental health disorder diagnosis and those without. The same pattern prevails for days absent from work due to medical leave. Interestingly, more women than men have been diagnosed with mental health disorders, in accordance with previous research (Lehtinen et al. 1990). Again, it is also evident that the employment histories of those with a diagnosis are more unstable than those who do not have a diagnosis. Between b and $b-3$, 64% of those without a mental health disorder diagnosis work the entire duration, whereas the corresponding figure is only 50% for those with a diagnosis. In addition, 24% of those with a diagnosis separate from their jobs between b and $b-3$, whereas only 17% of those without a diagnosis do. Obviously, we cannot state anything about causality based on these numbers.

In Table 2, the study sample is further narrowed to include only wage and salary earners, who will later be analyzed in the regression analysis in Table 3. Only employees who worked in an establishment that had at least 20 employees at time *b,* and the establishment in question

decreased their workforce by at least 20% between b and $b + 1$, are included. In this way, we compare employees with and without mental health disorder diagnoses with stable work histories, which allows us to use for identification of the sudden, unexpected, and large reduction in the workforce between b and $b + 1$ as an exogenous shock to the employment of these workers.

[TABLE 2 AROUND HERE]

In Table 2, we also present the data differently compared to Table 1, as we compare those who are displaced with those who are not displaced. Restricting the data in this way, it is obvious that the sample is very different from that described in Table 1. The average earnings are now about €40,000 per year, for those who will become laid off and those who will not. The number of sick days is also considerably lower compared to Table 2, but it is still significantly higher for those who will be laid off (Figure 1).

To obtain a more complete picture of the effects, we also examine the main categories of mental health disorder diagnoses (Böckerman et al. 2021, Suvisaari et al. 2009, Santavirta et al. 2015). Table 2 shows, for example, that depression is a common reason for mental health disorders, and its prevalence is substantially higher among employees who will be laid off than among those who will not.

[FIGURE 1 AROUND HERE]

4.2 Baseline results

Table 3 shows the results of equation (1) when establishments are required to have at least 20 employees at time *t,* and their workforce decreases by at least 20% between those two points in time. Column 1 of Table 3 reveals that having a mental health disorder diagnosis leads to a 6.1 percentage point higher probability of being laid off than not having one. This effect increases to

6.3 percentage points in column 2 when we enter medical leave as a dichotomous variable, indicating whether the employee has had any days off from work owing to illness, instead of entering it as a continuous variable.

[TABLE 3 AROUND HERE]

In column 3, we split the mental health disorder diagnosis variable into different dummy variables for the various mental health disorder diagnoses. As can be seen from the table, the largest effect is for substance abuse disorder. In most cases in the Finnish setting, this is alcohol abuse. Schizophrenia, a very severe form of mental illness, does not seem to affect the probability of being laid off. The reason is that the sample consists of employed individuals only, and individuals with schizophrenia very rarely participate in the labor market.

Finally, the control variables show the expected results. The number of sick days increases the probability of being laid off. Having higher earnings decreases the probability of being laid off, as does working at a larger establishment.

4.3 Robustness checks

To confirm these findings, in Appendix Tables B1–B8, we present the results of several robustness checks. In Table B1, only establishments that lay off more than 30% of their workforce are included, and in Table B2, only establishments with more than 50 employees at time *b* are included. In both tables, the number of observations is fewer than in Table 3, but the results are very similar to those in Table 3.

In Tables B3–B4, we split the sample into the manufacturing sector and the non-manufacturing sector, based on industry classifications. Again, we can see that this does not alter the results. In Table B5, we also include among those who are considered laid off those who left the establishment one year before the mass layoff, the so-called early leavers (Schwerdt 2011). To

do this, we do not require that employees work at the same establishment for the previous three years. This does not change the results to any substantial extent. Moreover, we conduct a kind of robustness check of Table B5, where we relax the requirement that employees must have worked at the same firm during the previous three years, but otherwise, the regression model is the same as in Table 3. We find that the results, shown in Table B6, are very similar to those in Table B5.

We further split the sample into men and women in Tables B7 and B8. Overall, this does not change the results particularly much, apart from some interesting differences in column 3 of both tables. From these, it is clear that different diagnoses are important for women and men. For women, depression diagnosis has a particularly large positive effect on the probability of being laid off, whereas substance use disorder is important for both men and women. This is somewhat surprising, given that alcohol consumption and abuse are much more frequent among men than among women in Finland, and in most other countries as well (Mäkelä et al. 2006).

An additional issue concerns the cutoff point for sick days absent from work. To address this, in Table B9, we present the results in which only workers with fewer than 100 days of medical leave per year are included. This does not change the overall picture of the results, apart from the fact that the coefficient for sick days is smaller. Thus, although the number of employees who take more than 100 sick days in the sample is small, the probability that they are laid off is large, which affects that coefficient.

Finally, it is possible that future layoffs are anticipated by employees, thus causing mental distress before a mass layoff. For this reason, we have also estimated models in which the diagnoses are lagged by one additional year; that is, we measure the diagnoses from $b-1$ to $b-4$, instead of from b to $b-3$ (Table B10). The specification decreases the magnitude of the estimates, but overall, they remain highly significant. However, for some of the diagnoses, the

estimates are small and no longer significant, suggesting a potential role for the anticipation effects (see column 3).

5. Conclusion

Health and work are evidently closely linked. Individuals with poor health face many challenges in the labor market, such as lower earnings and higher unemployment risk. Modern societies have developed social safety nets (such as income transfers) and policy interventions (such as training programs) to mitigate these problems.

Similar to many other developed countries, in Finland, binding collective labor market agreements forbid discrimination in mass layoffs between employees based on health reasons. Nevertheless, we find empirically that even when we, in the regressions, require employees to have worked at the same firm at least three years before a mass layoff and include a rich set of controls in the models, those with a mental health disorder diagnosis still have a significantly higher probability of being laid off in mass layoffs.

The exact mechanism behind these empirical findings is unclear, but employers are most likely to include those with mental health disorders in the group of employees who are laid off for economic reasons. Thus, although we control for employees' earnings and days absent for illness (i.e., a general measure of health) in the regressions, it may still be that employers view the productivity and job performance of employees as not fully captured by these characteristics.

In addition to mental health, we find that medical leave in general seems to predict who loses their jobs during a mass layoff. This finding suggests that firms use mass layoffs to get rid of employees with lower and compromised productivity and higher non-wage costs in the long run. Moreover, the results indirectly shed light on the issue of the validity of the argument that unemployment incidence is strictly exogenous in studies based on firm mass layoffs.

More generally, mental health disorders are quickly becoming a major source of ill health, especially in developed countries (Vigo et al. 2016, Whiteford et al. 2013). For example, in Finland, mental health disorders have become the leading cause of disability retirement (Finnish Centre for Pensions 2020). Moreover, mental health disorders increase the risk of poor physical health (Sareen et al. 2006). The empirical observation that those with poor mental health face a higher probability of losing their job calls for additional protection to shield this vulnerable worker group. This is important because unemployment itself leads to poor physical and mental health.

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TABLES AND FIGURES

Table 1. Characteristics of individuals with and without mental health diagnoses

	All individuals		Working only	
	No Diagnosis	Diagnosis	No diagnosis	Diagnosis
Age	40.62 (23.38)	40.81 (17.87)	41.51 (12.11)	38.79 (11.92)
Annual earnings (€/year), year b	15401 (26309)	7212 (13364)	28161 (30963)	20216 (16515)
Female (yes/no)	0.51	0.56	0.49	0.61
Number of sickness days per year, between b and $b-3$	1.64 (15.32)	11.84 (43.16)	2.24 (16.47)	13.48 (42.91)
Education: ISCED levels 1-2 (yes/no)	0.48	0.45	0.17	0.20
Education: ISCED levels 3-4 (yes/no)	0.30	0.38	0.45	0.48
Education: ISCED levels 5-8 (yes/no)	0.21	0.18	0.38	0.32
Working between b and $b-3$ (yes/no)	0.26	0.14	0.64	0.50
Working in same establishment between b and $b-3$ (yes/no)	0.18	0.08	0.43	0.29
Average earnings between b and $b-3$ (€/year)	17673 (27173)	8346 (13759)	30312 (30935)	21023 (16481)
Separated from job (yes/no), between b and $b+1$	0.07	0.07	0.17	0.24
Number of observations	114 313 105	3 302 687	47 037 131	928 363

Note: Standard deviations in parentheses.

Table 2. Characteristics of displaced and not displaced individuals

	Not separated	Separated
Age (years)	41.805	40.247
	(10.01)	(10.66)
Number of sickness days per year between b and $b-3$	2.195	4.763
	(15.32)	(26.33)
Any mental health diagnosis between b and $b-3$ (yes/no)	0.017	0.026
Anxiety disorder between b and $b-3$ (yes/no)	0.003	0.005
Depression between b and $b-3$ (yes/no)	0.006	0.010
Bipolar disorder between b and $b-3$ (yes/no)	0.001	0.002
Other nonaffective psychosis disorder between b and $b-3$ (yes/no)	0.001	0.002
Schitzophrenia between b and $b-3$ (yes/no)	0.000	0.000
Substance use disorder between b and $b-3$ (yes/no)	0.002	0.003
Education: ISCED levels 1-2 (yes/no)	0.166	0.167
Education: ISCED levels 3-4 (yes/no)	0.472	0.477
Education: ISCED levels 5-8 (yes/no)	0.362	0.356
Average earnings between b and $b-3$ (€/year)	41791	39354
	(30104)	(42174)
Working in industrial sector (yes/no)	0.498	0.464
Number of observations	471507	211873

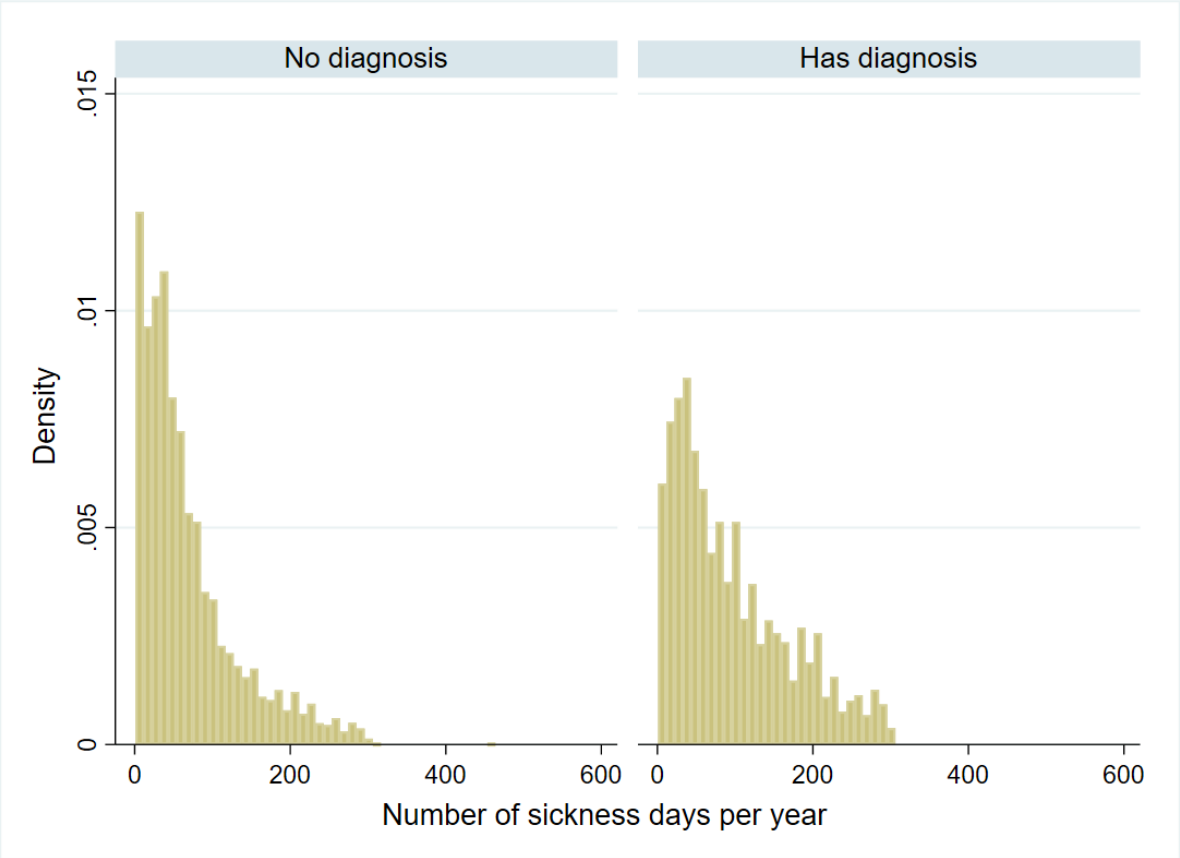
Note: Individuals included are aged 18–59, working in the private sector, having worked at least three years in the same establishment before layoffs. Establishments included have > 20 employees and workforce decreasing at least 20%. Earnings in euros are deflated to prices of 2015 using the Consumer Price Index. Standard deviations in parentheses.

Table 3. The effect of having mental health diagnosis on displacement

	(1)	(2)	(3)
Any mental health diagnosis (yes/no)	0.0608***	0.0631***	
	(0.0036)	(0.0036)	
Anxiety disorder (yes/no)			0.0457***
			(0.0080)
Depression (yes/no)			0.0639***
			(0.0058)
Bipolar disorder (yes/no)			0.0579***
			(0.0144)
Other nonaffective psychosis (yes/no)			0.0492***
			(0.0143)
Schizophrenia (yes/no)			-0.0249
			(0.0259)
Substance use (yes/no)			0.0753***
			(0.0108)
Sickness absence (days)	0.0009***		0.0009***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0672***	
		(0.0018)	
Log of average earnings, from b to $b-3$	-0.0938***	-0.0979***	-0.0939***
	(0.0014)	(0.0014)	(0.0014)
Log of establishment size	-0.0578***	-0.0576***	-0.0578***
	(0.0020)	(0.0020)	(0.0020)
Female	-0.0203***	-0.0217***	-0.0203***
	(0.0013)	(0.0013)	(0.0013)
Number of observations	655433	655433	655433
Number of establishments	14018	14018	14018
R^2	0.01	0.01	0.01

Note: Individuals included are aged 18–59, working in the private sector, having worked at least three years in the same establishment before layoffs. Establishments included have > 20 employees and workforce decreasing at least 20%. Earnings in euros are deflated to prices of 2015 using the Consumer Price Index. All fixed effects linear probability models also include indicator variables for age, education level, and year. All diagnosis variables are dichotomous variables indicating whether the worker has had the diagnosis during the last 3 years. Models with sickness absence for mental health reasons (both as continuous and binary) as explanatory variables instead of the diagnosis based variable were also estimated. The results of those were not quantitatively and qualitatively different to those presented in this model. All models include fixed effects at the establishment level. Standard errors in parentheses. * p<0.05, ** p<0.01, *** p<0.001.

Figure 1: Distribution of the number of sickness days by diagnosis status



Note: Individuals included are aged 18–59, working in the private sector, having worked at least three years in the same establishment before layoffs. Establishments included have > 20 employees and workforce decreasing at least 20%. Workers with zero sickness days are not included.

SUPPLEMENTARY ONLINE APPENDICES

Appendix A: Key aspects of the Finnish healthcare system

In Finland, every citizen is entitled to universal public health services regardless of their ability to pay or their place of residence. Municipalities are responsible for providing primary health care in their area. However, the role of occupational (and private) health services has increased over time. According to the Occupational Health Care Act of 743/1978, employers must arrange preventative health care for their employees. In addition to compulsory occupational health care, employers can also voluntarily provide medical care and additional health care for their employees. Nowadays, the coverage of occupational health services among wage earners is 87 per cent (Kela 2021).

The primary goal of occupational health care has been to prevent work-related illnesses and accidents rather than curing them (Martimo and Mäkitalo 2014). However, currently, the occupational health expenditures on medical care are roughly the same as those on preventive care (Kela 2021). Thus, occupational health services are important for the promotion of employees' health, work capacity, and productivity in workplaces in Finland. Employers often buy occupational health services from a private clinic or municipal health centre. The share of private clinics among service providers increased during the 2000s. Accordingly, the number of physicians, psychologists, and physiotherapists working in occupational health care has also increased (Lappalainen et al. 2016).

Social Insurance Institution of Finland (Kela) provides financial support for employers. Employers are entitled to receive compensation for necessary and reasonable costs resulting from occupational health care (50–60 per cent of acceptable costs). Employees cannot be charged for the use of occupational health care, but both employers and employees participate in financing the scheme through national health insurance payments. The expenditures on occupational health care have increased almost every year since 1965 (Kela 2021, Martimo and Mäkitalo 2014).

Appendix B. Supplementary Tables

Table B1. The effect of having mental health diagnosis on displacement, larger layoff.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0570***	0.0589***	
	(0.0047)	(0.0047)	
Anxiety disorder (yes/no)			0.0416***
			(0.0107)
Depression (yes/no)			0.0627***
			(0.0077)
Bipolar disorder (yes/no)			0.0710***
			(0.0186)
Other nonaffective psychosis (yes/no)			0.0465*
			(0.0189)
Schizophrenia (yes/no)			-0.0470
			(0.0344)
Substance use (yes/no)			0.0701***
			(0.0143)
Sickness absence (days)	0.0008***		0.0008***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0625***	
		(0.0024)	
Log of average earnings	-0.0860***	-0.0892***	-0.0861***
	(0.0019)	(0.0018)	(0.0019)
Log of establishment size	-0.0470***	-0.0470***	-0.0470***
	(0.0028)	(0.0028)	(0.0028)
Female	-0.0240***	-0.0252***	-0.0240***
	(0.0017)	(0.0017)	(0.0017)
Number of observations	376367	376367	376367
Number of establishments	9757	9757	9757
R^2	0.02	0.02	0.02

Note: Establishments included have > 20 employees and workforce decreasing at least 30%. Other sample restrictions are the same as in Table 3.

Table B2. The effect of having mental health diagnosis on displacement, larger firms.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0579***	0.0602***	
	(0.0042)	(0.0042)	
Anxiety disorder (yes/no)			0.0390***
			(0.0094)
Depression (yes/no)			0.0603***
			(0.0068)
Bipolar disorder (yes/no)			0.0423*
			(0.0168)
Other nonaffective psychosis (yes/no)			0.0342*
			(0.0168)
Schizophrenia (yes/no)			-0.0235
			(0.0323)
Substance use (yes/no)			0.0868***
			(0.0127)
Sickness absence (days)	0.0009***		0.0009***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0671***	
		(0.0021)	
Log of average earnings	-0.0904***	-0.0945***	-0.0905***
	(0.0017)	(0.0017)	(0.0017)
Log of establishment size	-0.0604***	-0.0603***	-0.0604***
	(0.0025)	(0.0025)	(0.0025)
Female	-0.0183***	-0.0198***	-0.0183***
	(0.0015)	(0.0015)	(0.0015)
Number of observations	467436	467436	467436
Number of establishments	4657	4657	4657
R^2	0.01	0.01	0.01

Note: Establishments included have > 50 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B3. The effect of having mental health diagnosis on displacement, industrial sector only.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0672***	0.0693***	
	(0.0058)	(0.0058)	
Anxiety disorder (yes/no)			0.0396**
			(0.0132)
Depression (yes/no)			0.0663***
			(0.0096)
Bipolar disorder (yes/no)			0.0524*
			(0.0253)
Other nonaffective psychosis (yes/no)			0.0718**
			(0.0234)
Schizophrenia (yes/no)			-0.0142
			(0.0466)
Substance use (yes/no)			0.0835***
			(0.0154)
Sickness absence (days)	0.0009***		0.0009***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0738***	
		(0.0025)	
Log of average earnings	-0.1101***	-0.1167***	-0.1103***
	(0.0025)	(0.0025)	(0.0025)
Log of establishment size	-0.0645***	-0.0644***	-0.0644***
	(0.0033)	(0.0033)	(0.0033)
Female	-0.0149***	-0.0171***	-0.0148***
	(0.0020)	(0.0020)	(0.0020)
Number of observations	310815	310815	310815
Number of establishments	5101	5101	5101
R^2	0.01	0.01	0.01

Note: Establishments included have > 20 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B4. The effect of having mental health diagnosis on displacement, non-industrial sector only.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0580***	0.0603***	
	(0.0045)	(0.0045)	
Anxiety disorder (yes/no)			0.0506***
			(0.0100)
Depression (yes/no)			0.0638***
			(0.0072)
Bipolar disorder (yes/no)			0.0635***
			(0.0173)
Other nonaffective psychosis (yes/no)			0.0398*
			(0.0179)
Schizophrenia (yes/no)			-0.0341
			(0.0307)
Substance use (yes/no)			0.0641***
			(0.0151)
Sickness absence (days)	0.0008***		0.0008***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0585***	
		(0.0025)	
Log of average earnings	-0.0829***	-0.0856***	-0.0830***
	(0.0018)	(0.0018)	(0.0018)
Log of establishment size	-0.0423***	-0.0421***	-0.0423***
	(0.0027)	(0.0027)	(0.0027)
Female	-0.0254***	-0.0263***	-0.0254***
	(0.0017)	(0.0017)	(0.0017)
Number of observations	344618	344618	344618
Number of establishments	9102	9102	9102
R^2	0.02	0.02	0.02

Note: Establishments included have > 20 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B5. The effect of having mental health diagnosis on displacement, early leavers included.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0551***	0.0563***	
	(0.0027)	(0.0027)	
Anxiety disorder (yes/no)			0.0284***
			(0.0058)
Depression (yes/no)			0.0541***
			(0.0043)
Bipolar disorder (yes/no)			0.0652***
			(0.0108)
Other nonaffective psychosis (yes/no)			0.0532***
			(0.0108)
Schizophrenia (yes/no)			-0.0618**
			(0.0190)
Substance use (yes/no)			0.0727***
			(0.0079)
Sickness absence (days)	0.0007***		0.0007***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0640***	
		(0.0016)	
Log of average earnings	-0.0932***	-0.0945***	-0.0934***
	(0.0008)	(0.0008)	(0.0008)
Log of establishment size	-0.0412***	-0.0411***	-0.0412***
	(0.0017)	(0.0017)	(0.0017)
Female	-0.0195***	-0.0203***	-0.0194***
	(0.0010)	(0.0010)	(0.0010)
Number of observations	1020891	1020891	1020891
Number of establishments	15673	15673	15673
R^2	0.08	0.08	0.08

Note: Establishments included have > 20 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B6. The effect of having mental health diagnosis on displacement, early leavers not included.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0558***	0.0572***	
	(0.0026)	(0.0026)	
Anxiety disorder (yes/no)			0.0315***
			(0.0056)
Depression (yes/no)			0.0529***
			(0.0042)
Bipolar disorder (yes/no)			0.0725***
			(0.0105)
Other nonaffective psychosis (yes/no)			0.0661***
			(0.0105)
Schizophrenia (yes/no)			-0.0592**
			(0.0184)
Substance use (yes/no)			0.0727***
			(0.0077)
Sickness absence (days)	0.0008***		0.0008***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0638***	
		(0.0015)	
Log of average earnings	-0.0977***	-0.0991***	-0.0979***
	(0.0008)	(0.0008)	(0.0008)
Log of establishment size	-0.0472***	-0.0471***	-0.0472***
	(0.0017)	(0.0017)	(0.0017)
Female	-0.0214***	-0.0222***	-0.0213***
	(0.0010)	(0.0010)	(0.0010)
Number of observations	1020891	1020891	1020891
Number of establishments	15673	15673	15673
R^2	0.07	0.07	0.07

Note: Establishments included have > 20 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B7. The effect of having mental health diagnosis on displacement, women only.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0599***	0.0619***	
	(0.0051)	(0.0051)	
Anxiety disorder (yes/no)			0.0605***
			(0.0110)
Depression (yes/no)			0.0814***
			(0.0078)
Bipolar disorder (yes/no)			0.0652**
			(0.0210)
Other nonaffective psychosis (yes/no)			0.0675**
			(0.0222)
Schizophrenia (yes/no)			-0.0040
			(0.0416)
Substance use (yes/no)			0.0823***
			(0.0223)
Sickness absence (days)	0.0008***		0.0008***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0592***	
		(0.0028)	
Log of average earnings	-0.0945***	-0.0974***	-0.0947***
	(0.0022)	(0.0022)	(0.0022)
Log of establishment size	-0.0809***	-0.0806***	-0.0809***
	(0.0034)	(0.0034)	(0.0034)
Number of observations	247252	247252	247252
Number of establishments	12025	12025	12025
R^2	0.03	0.03	0.03

Note: Establishments included have > 20 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B8. The effect of having mental health diagnosis on displacement, men only.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0592***	0.0618***	
	(0.0051)	(0.0051)	
Anxiety disorder (yes/no)			0.0511***
			(0.0121)
Depression (yes/no)			0.0598***
			(0.0089)
Bipolar disorder (yes/no)			0.0715***
			(0.0203)
Other nonaffective psychosis (yes/no)			0.0406*
			(0.0190)
Schizophrenia (yes/no)			-0.0335
			(0.0338)
Substance use (yes/no)			0.0746***
			(0.0125)
Sickness absence (days)	0.0009***		0.0009***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0706***	
		(0.0024)	
Log of average earnings	-0.0976***	-0.1032***	-0.0978***
	(0.0020)	(0.0020)	(0.0020)
Log of establishment size	-0.0546***	-0.0546***	-0.0547***
	(0.0025)	(0.0025)	(0.0025)
Number of observations	408215	408215	408215
Number of establishments	13278	13278	13278
R^2	0.03	0.03	0.03

Note: Establishments included have > 20 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B9. The effect of having mental health diagnosis on displacement, less than 100 sickness days.

	(1)	(2)	(3)
Any diagnosis (yes/no)	0.0476***	0.0477***	
	(0.0037)	(0.0037)	
Anxiety disorder (yes/no)			0.0496***
			(0.0082)
Depression (yes/no)			0.0401***
			(0.0061)
Bipolar disorder (yes/no)			0.0432**
			(0.0154)
Other nonaffective psychosis (yes/no)			0.0333*
			(0.0150)
Schizophrenia (yes/no)			-0.0374
			(0.0266)
Substance use (yes/no)			0.0761***
			(0.0111)
Sickness absence (days)	0.0005***		0.0005***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0441***	
		(0.0019)	
Log of average earnings	-0.0934***	-0.0943***	-0.0936***
	(0.0014)	(0.0014)	(0.0014)
Log of establishment size	-0.0578***	-0.0578***	-0.0578***
	(0.0020)	(0.0020)	(0.0020)
Female	-0.0239***	-0.0242***	-0.0240***
	(0.0017)	(0.0017)	(0.0017)
Number of observations	648467	648467	648467
Number of establishments	14010	14010	14010
R^2	0.01	0.01	0.01

Note: Establishments included have > 20 employees and workforce decreasing at least 20%. Other sample restrictions are the same as in Table 3.

Table B10. The effect of having mental health diagnosis on displacement

	(1)	(2)	(3)
Any mental health diagnosis (yes/no)	0.0385***	0.0391***	
	(0.0041)	(0.0041)	
Anxiety disorder (yes/no)			0.0200*
			(0.0083)
Depression (yes/no)			0.0316***
			(0.0062)
Bipolar disorder (yes/no)			0.0500***
			(0.0143)
Other nonaffective psychosis (yes/no)			0.0235
			(0.0142)
Schizophrenia (yes/no)			-0.0440*
			(0.0205)
Substance use (yes/no)			0.0368***
			(0.0105)
Sickness absence (days)	0.0008***		0.0008***
	(0.0000)		(0.0000)
Sickness absence (yes/no)		0.0630***	
		(0.0020)	
Log of average earnings	-0.0917***	-0.0959***	-0.0920***
	(0.0015)	(0.0015)	(0.0015)
Log of establishment size	-0.0556***	-0.0555***	-0.0555***
	(0.0024)	(0.0024)	(0.0024)
Female	-0.0172***	-0.0184***	-0.0172***
	(0.0014)	(0.0014)	(0.0014)
Observations	521436	521436	521436
Establishments	11901	11901	11901
R^2	0.01	0.01	0.01

Note: Diagnoses have been measured from *b*–1 to *b*–4, compared to *b* to *b*–3 in the other models. Otherwise, see notes to Table 3.