

Working while sick in context of regional unemployment: a Europe-wide cross-sectional study

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ABSTRACT

Background Research suggests that areas with high unemployment have lower rates of sickness absence, but the underlying mechanisms remain unclear. One assumption is that when unemployment is high people are more likely to work while being sick (discipline hypothesis). Against this background, we investigate the association between regional unemployment and sickness presenteeism. Second, we study interactions with factors of occupational disadvantage.

Methods We combined survey data of 20 974 employees collected 2015 in 232 regions from 35 European countries with data on regional unemployment rates obtained from Eurostat. Presenteeism was assessed by the fraction of days worked while ill among all days with illness (presenteeism propensity). To investigate if unemployment was related to presenteeism, we estimated multi-level models (individuals nested in regions) that were adjusted for socio-demographic and occupational covariates to account for compositional differences of the regions.

Results The mean presenteeism propensity was 34.8 (SD 40.4), indicating that workers chose presenteeism in 1 out of 3 days with sickness. We found that a change in unemployment by +10 percentage points was associated with a change in presenteeism by +5 percentage points (95% CI 1.2 to 8.6). This relationship was more pronounced among workers with low salary, low skill-level, and industrial and healthcare workers.

Conclusion Our results support the assumption that high unemployment elevates presenteeism, and that people in disadvantaged occupations are particularly affected. Policies managing presenteeism should consider the labour market context, particularly during the aftermath of the COVID-19 pandemic.

INTRODUCTION

Sickness presenteeism describes employees attending work despite being ill.¹ This behaviour can have unfavourable consequences for workers' health due to lacking recovery time² and transmission of infectious diseases.³ The relevance of presenteeism has also changed since the outbreak of COVID-19, where showing up at work despite symptoms or illness can increase the spread of the virus in populations.⁴ Nevertheless, around 40% of the employees in European countries work during illness at least once a year⁵, with recent numbers appearing to increase.⁶ To give a basis for prevention policies and guidelines, gaining a deeper insight into the motives for presenteeism is urgent.

Past research could demonstrate that a range of personal and work-related characteristics determine the decision to work while sick. Personal

characteristics that increase presenteeism include positive job attitudes, feelings of high obligation or having the idea of absence as a less legitimate option.⁷ Furthermore, work-related factors that are linked to presenteeism are job insecurity, work stress, irreplaceability, low support, restrictive sick pay policies and increased attendance pressure.¹

So far, research has only focussed on individual and work-related determinants of presenteeism. An important aspect, however, is that individuals are embedded in specific contexts, such as countries, regions, and labour markets. Features of such contexts can have an impact on people's behaviour. For example, cross-sectional and longitudinal studies observed that high regional unemployment is related to lower sickness absence rates^{8,9} and lower participation in medical rehabilitation.¹⁰ It was also found that this correlation is not driven by selection effects.¹¹ One assumption of past studies is that lower levels of sickness absence might be a result of increased presenteeism, supposing that workers are more likely to work while sick when unemployment is high. This may be particularly true for workers who are more at risk of job loss.

Therefore, the present study aimed to test if high unemployment was related to an elevated propensity for presenteeism in a sample including several European countries. According to the so-called discipline hypothesis,⁸ we assumed that employees were more likely to choose presenteeism over sickness absence when regional unemployment was high and the prospect for finding other work was consequently low. More generally, this refers to the assumption of Caverley *et al* (2007), who predict that individuals will substitute sickness absence with presence when absence is an unavailable choice, for example in case of job insecurity or financial uncertainty that is more pronounced when regional unemployment is high.¹²

Second, the risk of job loss and the resulting financial hardship is supposed to be more threatening for workers in disadvantaged occupations, who had less financial resources or a lower chance of re-employment.¹³ As a consequence, the second objective was to investigate if income, skill-level, contract permanency and working sector moderates the association between unemployment rate and presenteeism.

To investigate both research questions, we relied on survey data from 20 974 employees nested within 232 European regions combined with official data on regional unemployment rates obtained from Eurostat. In contrast to studies on unemployment and sickness absence, we measure presenteeism directly by the number of days worked while ill in



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relation to the total number of days with illness, the so-called presenteeism propensity,¹⁴ which allows assessing how often workers chose sickness presence over sickness absence, independently of a person's general health condition. Further, the use of a broad data set including an almost exhaustive number of European countries allowed us to draw conclusions about Europe as a whole that would not be possible with single-country studies.

METHODS

Data

We combined data on regional unemployment rates retrieved from Eurostat¹⁵ with survey data of the 2015 European Working Conditions Survey (EWCS).¹⁶ Unemployment rates of Albania were retrieved from the World Bank.¹⁷ Datasets were matched on basis of the NUTS classification system in its version from 2013 (*Nomenclature des Unités territoriales statistiques*),¹⁸ a geographical system structuring the territory of Europe into hierarchical levels. Regional affiliation for six countries was based on NUTS-1 (major regions) and for 29 countries on NUTS-2 (basic regions), depending on the sampling procedure of the EWCS.

Participants were selected by drawing a multi-stage, stratified, random sample in each country. The sample size ranged from 1000 to 3300 cases by country. Face-to-face interviews at respondent's home were carried out between February and September 2015. The average response rate was 43%. Variation of response rates between countries was not affecting the results of this study (see also sensitivity analyses). The technical report gives a more detailed description of the methodology.¹⁹

Study sample

The original sample comprised 43 850 interviews from 35 European countries. We restricted the sample to employees, who were between 15 and 65 years old, working at least 10 hours per week and did not report to have a chronic disease or disability. Self-employed ($n=7997$) were excluded because they strongly differ from employees in their attendance behaviour.²⁰

The study sample was further restricted to participants that reported at least one health event during the last year (either sickness presence or absence). Since we are interested in the decision for or against presenteeism, participants without any days of sickness ($n=11\ 236$) were not of interest. In accordance with previous studies, we accounted for chronic health problems by excluding 363 participants reporting very high numbers of sickness absence or presence exceeding 70 days per year.²¹ The final sample comprised $n=20\ 974$ interviews, which were 47.8% of the original sample.

Variables

Sickness presenteeism

Presenteeism was assessed through the presenteeism propensity (PP), which is the fraction of days worked while ill in relation to all days with illness multiplied by 100. The PP assesses how often a person chooses presenteeism over sickness absence regardless of their general health condition.¹⁴ The number of days worked while ill was measured by the question: 'Over the past 12 months how many working days did you work when you were sick?' The number of days with illness was the sum of days worked while ill and days of sickness-related absence. Sickness absence was measured by the question: 'Over the past 12 months how many days

in total were you absent from work due to sick leave or health-related leave?' In case of a job tenure less than 1 year, both items related to the time since the job started. The PP can range between 0 (no day worked while sick) and 100 (worked on each day during sickness).

In contrast to administrative data on sickness absence, self-reported measures are more comparable across countries because they do not vary according to country-specific recording procedures.²² Studies found high levels of agreement if both data sources are compared.²³

Regional unemployment rates

The unemployment rate was the relative number of unemployed people as percentage of the labour force in each region. We used unemployment rates of 2014 covering the reference period for presenteeism. Regional data were preferred to country data because unemployment rates can vary within countries. Regional data simultaneously allow to increase the number of second-level units enhancing statistical power.²⁴

Socio-demographical and occupational factors

We included a range of socio-demographic and occupational factors to control for compositional features of the European regions and to test if the association between unemployment and presenteeism varied by occupational factors. We considered respondent's age in years, gender, type of household, migration background, number of weekly working hours, job tenure in years, income from main paid job in percent of the country median, occupational position, working sector, type of employment contract, company size and if the organisation has a trade union. On regional-level, we account for degree of urbanisation (Eurostat's DEGURBA classification) distinguishing between urban, intermediate and rural areas.

As a measure of occupational position, we regrouped occupations from the 2-digit version of the International Standard Classification of Occupations (ISCO-08) according to the European Socio-economic Classification (ESeC).²⁵ The classification of the working sector was based on the 2-digit version of the *Nomenclature statistique des activités économiques dans la Communauté européenne* (NACE).

Statistical analysis

First, we described the study population in terms of socio-demographic and occupational characteristics. When reporting frequencies or means across countries, we applied national weights to give greater weight to countries with many inhabitants. We plotted mean values of PP against national and regional unemployment rates using a scatterplot, and calculated respective spearman's rank order correlation.

Second, we used a series of multi-level regression models to analyse the association between unemployment rate and PP. Multi-level modelling is appropriate when observations are nested in higher-level groups, such as individuals nested in regions.²⁶ We decided against a three-level model with countries as an additional level, as there was no further breakdown at NUTS-2 level for eight countries. However, as a part of sensitivity analyses, we also ran a three-level model and found similar results (sensitivity analyses).

After graphical inspection of the outcome variable, we found PP non-normally distributed with 42.3% of the respondents reporting 0 days worked during illness and 21.7% reporting all days worked during illness. We therefore used a multi-level

generalised linear model (MGLM) with a binomial probability distribution and a logit link function. We used robust SEs to increase accuracy of significance tests and CIs in case of non-normally distributed response variables.²⁶ Results of regression analyses are presented as average marginal effects (AME). AMEs facilitate the interpretation of results compared with ORs, expressing the change in PP in percentage points when comparing groups (nominal variables) or when increasing continuous variables by one scale point.²⁷

We ran an empty model without any covariates and calculated the intraclass correlation (ICC) to quantify the variance in PP at the individual and regional-level. In Model 1, we included socio-demographic and occupational variables to account for compositional differences of the regions. In Model 2, we tested if regional unemployment was related to presenteeism and assessed the decrease of variance at the regional-level. Since variance components across different logit regression models are not comparable, variance components were rescaled following the procedure described at Hox (2010, p. 133–138).²⁶ We determined if unemployment significantly adds to the model fit by comparing the deviances of both models using a Wald test. The number of days with illness (the sum of SP and SA days) was included in Models 1 and 2 to handle different chances of extreme high or low PP values. For example, individuals with few days of illness are more likely to have a PP of 0 or 100 than those with more days of illness.

Third, to test if the association between the regional unemployment rate and presenteeism varied by income, skill-level, type of contract and working sector, we additionally ran a model including respective interaction terms. As preferable for analysing interactions of multi-categorical variables, we used a Wald test to compare models with and without interactions and assessed if the joint interaction significantly increased the model fit, rather than relying on the significance of the coefficients for single interaction terms.

Missing values were filled using multiple imputations by chained equations with a predictive mean matching procedure.²⁸ Patterns of missing information are shown in the online supplemental file (e-table 1). For comparison, we also performed the main analyses on the subset of complete cases and found similar results.

All analyses were performed using Stata 16.1 MP (64-bit, StataCorp LLC, College Station, TX, USA).

RESULTS

Sample description

Table 1 describes the study sample. 49.8% of the sample were women, and the mean age was 41.8 years (SD 11.4). The mean PP was 34.8 (SD 40.4), indicating that every third day of illness led to presenteeism. The unemployment rate and mean presenteeism propensity in each of the 232 regions are listed in the online supplemental file (e-table 2).

Figure 1 shows a weak, positive correlation between unemployment and presenteeism on regional and country level, reaching statistical significance on regional level ($r_s=0.196$, $p=0.003$, $n=232$).

Unemployment rate and presenteeism

Table 2 shows the results of the multi-level binomial regression. In the empty model (not shown), the intraclass correlation (ICC) was 0.190 (95% CI 0.16 to 0.22). Thus, 19% of the variation in PP was due to differences between regions and 81% was between individuals.

Table 1 Sample description

Variable	Categories (or range)	N or mean	% or \pm SD
Gender	Male	10 757	49.8
	Female	10 839	50.2
Age in years	(15–65)	41.8	\pm 11.4
Type of household	Single, no children	3410	15.8
	Couple, no children	7570	35.1
	Couple with children	6523	30.2
	Single with children	1061	4.9
Migration background	Others	3031	14.0
	No	19 165	88.7
	Yes	2431	11.3
Weekly working hours	(10–105)	38.7	\pm 10.7
Job tenure in years	(0–50)	9.7	\pm 9.2
Income (% of country median)	(0.04–5998.67)	115.6	\pm 101.3
Occupational position (ESeC)	Semi- and unskilled workers	2782	12.9
	Skilled workers	3276	15.2
	Lower grade white-collar workers	4941	22.9
	Higher grade blue-collar workers	874	4.0
	Higher grade white-collar workers	2240	10.4
	Lower salariat	5224	24.2
	Higher salariat	2260	10.5
Working sector (NACE)	Agriculture	329	1.5
	Industry	3627	16.8
	Construction	1337	6.2
	Transport	1334	6.2
	Commerce and hospitality	4055	18.8
	Financial services	855	4.0
	Public administration	1587	7.3
	Education	2094	9.7
	Health	2591	12.0
	Other services	3788	17.5
Non-permanent contract	No	19 807	91.7
	Yes	1789	8.3
Company size	<10	5287	24.5
	10–249	8922	41.3
	250+	7387	34.2
Organisation has a trade union	No	11 267	52.2
	Yes	10 329	47.8
Days of sickness absence	(0–70)	7.1	\pm 10.6
Days of sickness presence	(0–70)	3.8	\pm 7.4
Days with illness	(0–130)	11.0	\pm 13.6
Presenteeism propensity	(0–100)	34.8	\pm 40.4
Degree of urbanisation	Urban	10 175	47.1
	Intermediate	6703	31.0
	Rural	4718	21.8
Regional unemployment rate	(2.5–34.8)	9.8	\pm 6.0
Total		21 596	100.0

ESeC, European Socio-economic Classification; NACE, Nomenclature statistique des activités économiques dans la Communauté européenne; SD, Standard deviation. National weight applied.

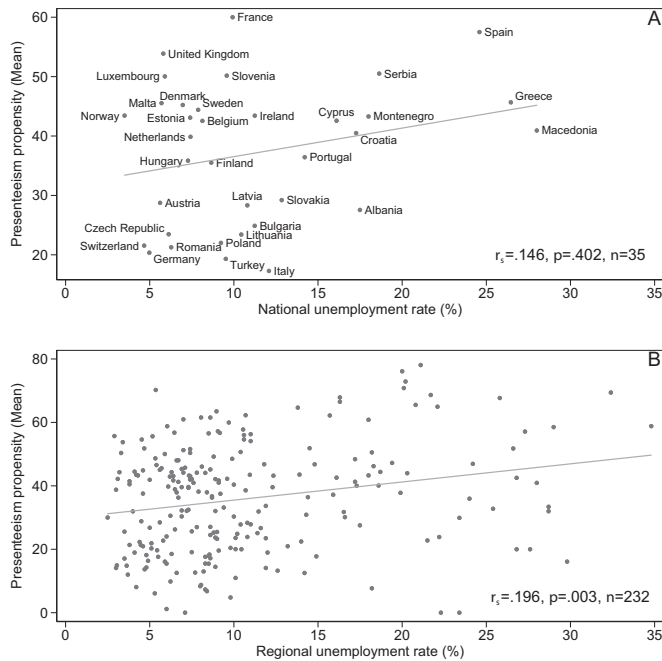


Figure 1 Mean presenteeism propensity by unemployment rate on (A) national level and (B) regional level. Graph A shows summarised propensities for 20 974 individuals of 35 countries. Graph B shows summarised propensities for 20 974 individuals of 232 regions on NUTS-2 level. One region (EL62) with a mean presenteeism propensity of 100 is not shown. r_s =Spearman's rank-order correlation.

In Model 1, we found the tendency towards presenteeism was higher for women than for men, as well as for young workers compared to older age groups. Further factors associated with presenteeism were to report a migration background, long working hours, high occupational position, working in the educational sector, and having a non-permanent working contract. Presenteeism was more common in larger companies. Illness days were positively associated with PP. Further, couples or singles having children were more prone to presenteeism compared to childless people. Notably, the presence of a trade union in the company was associated with a lower tendency to work while ill. No difference in presenteeism was found according to job tenure, income or degree of urbanisation. As indicated by the variance component of Model 1, we found socio-demographic and occupational characteristics reducing the variation in PP at the individual-level by 11.3% and at the regional-level by 15.9%.

In Model 2, we found that regional unemployment was positively associated with presenteeism. Precisely, a change in regional unemployment of +1 percentage point was associated with a change in presenteeism by +0.49 percentage points (95% CI 0.12 to 0.86). Accordingly, a change +10 percentage points in unemployment was related to a change in presenteeism by +4.9 percentage points (95% CI 1.2 to 8.6). After introducing unemployment to the model, regional-level variance decreased by 19.7%, indicating that around 4% of the variance in PP between regions was attributable to the unemployment rate. As indicated by the Wald test, the model fit increased significantly after taking unemployment into account (table 2).

Figure 2 shows the relationship between the unemployment rate and presenteeism adjusted for compositional differences of the regions. For example, comparing regions with an unemployment rate of 5% to those with 20% was associated with a change in PP from 51.9 to 59.3%.

Interactions with factors of occupational disadvantage

As shown in figure 3, we found that the association between unemployment and presenteeism was stronger among low-paid and low-skilled workers. Additionally, we found an elevated link among industrial and healthcare workers. There was no difference according to the type of working contract.

In additional analyses, we found no difference according to gender, but observed that age seemed to constitute a factor, showing some stronger association for older workers compared with younger cohorts.

Sensitivity analyses

In a three-level model with countries as the third level, the ICC revealed that presenteeism varied by 10.1% between countries and by 15.6% between regions. The main effect of unemployment in a three-level model did not change in direction and strength, but showed some lower p -value (AME 0.47, 95% CI 0.00 to 0.94, $p = 0.052$). We also ran an additional model with a squared term of unemployment to test for non-linearity. However, a Wald test revealed that the model fit did not increase ($p = 0.890$). Since response rates varied between countries, we tested if results were driven by nonresponse. We calculated a model including the country response rate and found that results did not change.

DISCUSSION

Main results

In this study, we tested if regional unemployment was associated with presenteeism and studied variations by factors of occupational disadvantage. We found that presenteeism was more likely when regional unemployment was high, even after taking into account different socio-structural compositions of European regions. Consistent with the literature on sickness absence and medical rehabilitation,^{8–11} employees tended to avoid being absent from work when unemployment was high. One explanation here might be that employees often see presenteeism as a way of minimising the risk of dismissal by signalling irreplaceability or high job commitment. Support for this explanation is found in studies observing increased presenteeism in context of occupational downsizing¹ and temporary employment.²⁹ One implication of the overall finding is that strategies aiming to reduce presenteeism must consider the role of labour market contexts. Notably, this may receive additional relevance in the near future, where economic consequences of the COVID-19 pandemic will result in raising unemployment rates worldwide, especially among those countries with less economic resources.³⁰ Increasing presenteeism behaviour, however, will counteract prevention measures that aim to reduce virus transmission.⁴

Although high unemployment was associated with elevated presenteeism, we found this relationship qualified by interactions with workers' income, skill-level and working sector. Workers were more prone to choose presenteeism in case of high unemployment when income or skill-level was low, or if they were industry or healthcare workers. An explanation for this might be that people in the lowest socio-economic positions are those financially most depending on their job. Therefore, low-skilled or low-paid workers might be stimulated by high unemployment more easily than managers or professionals. As this has the potential to increase social inequalities in times of the crisis,³¹ strategies aiming to reduce presenteeism should consider that embeddedness in weak labour market is more relevant for workers in disadvantaged occupations. One possible reason for differences between working sectors may be that occupational norms

Table 2 Average marginal effects (AME) based on multi-level binomial regression for presenteeism propensity. Reading example: Among women, presenteeism propensity was 4.42 percentage points higher compared with men

	Model 1				Model 2			
	AME	95% CI		P	AME	95% CI		P
		Lower	Upper			Lower	Upper	
Level-1 variables								
Gender								
Female (Ref.: Male)	4.42	2.67	6.17	<0.001	4.41	2.66	6.16	<0.001
Age in years	-0.13	-0.21	-0.05	0.001	-0.13	-0.21	-0.05	0.001
Type of household								
Single, no children	Ref.				Ref.			
Couple, no children	-0.12	-2.21	1.96	0.907	-0.15	-2.24	1.94	0.886
Couple with children	1.93	-0.09	3.95	0.061	1.89	-0.13	3.91	0.067
Single with children	3.50	0.16	6.85	0.040	3.50	0.15	6.85	0.041
Others	0.92	-1.60	3.43	0.475	0.83	-1.68	3.35	0.516
Migration background								
Yes (Ref.: No)	2.68	0.71	4.65	0.008	2.74	0.76	4.71	0.007
Weekly working hours	0.28	0.20	0.36	<0.001	0.27	0.19	0.35	<0.001
Job tenure in years	0.01	-0.08	0.10	0.841	0.01	-0.08	0.10	0.885
Income (Std.)	-0.53	-1.55	0.49	0.305	-0.54	-1.58	0.49	0.302
Number of days with illness	0.60	0.50	0.70	<0.001	0.60	0.50	0.70	<0.001
Occupational position (ESeC)								
Semi- and unskilled workers	Ref.				Ref.			
Skilled workers	-1.09	-3.48	1.31	0.375	-1.04	-3.45	1.36	0.395
Lower grade white-collar workers	1.16	-1.49	3.81	0.390	1.20	-1.46	3.86	0.376
Higher grade blue-collar workers	4.65	0.42	8.89	0.031	4.74	0.50	8.99	0.029
Higher grade white-collar workers	1.20	-1.74	4.14	0.423	1.25	-1.69	4.19	0.405
Lower salariat	4.99	2.38	7.60	<0.001	5.07	2.46	7.69	<0.001
Higher salariat	8.64	5.94	11.34	<0.001	8.77	6.05	11.49	<0.001
Working sector (NACE)								
Agriculture	0.77	-4.82	6.37	0.786	0.72	-4.89	6.34	0.801
Industry	-1.51	-3.97	0.95	0.228	-1.51	-3.97	0.95	0.229
Construction	-0.67	-3.70	2.36	0.664	-0.63	-3.67	2.41	0.684
Transport	-1.81	-4.98	1.36	0.262	-1.81	-4.99	1.36	0.263
Commerce and hospitality	Ref.				Ref.			
Financial services	-2.07	-6.03	1.90	0.307	-2.06	-6.03	1.91	0.309
Public administration	-0.21	-3.00	2.58	0.883	-0.25	-3.05	2.55	0.862
Education	3.39	0.65	6.14	0.015	3.39	0.64	6.14	0.016
Health	-0.70	-3.20	1.79	0.581	-0.67	-3.18	1.84	0.599
Other services	-0.70	-2.84	1.45	0.525	-0.68	-2.84	1.47	0.533
Non-permanent contract								
Yes (Ref.: No)	6.06	3.33	8.78	<0.001	6.02	3.28	8.75	<0.001
Company size								
<10	Ref.				Ref.			
10–249	0.67	-1.02	2.36	0.437	0.75	-0.95	2.44	0.389
250+	4.32	2.19	6.46	<0.001	4.46	2.31	6.62	<0.001
Organisation has a trade union								
Yes (Ref.: No)	-2.11	-3.80	-0.42	0.014	-2.10	-3.80	-0.41	0.015
Level-2 variables								
Degree of urbanisation								
Urban	Ref.				Ref.			
Intermediate	1.86	-0.36	4.08	0.101	1.94	-0.29	4.17	0.088
Rural	-1.50	-3.85	0.85	0.210	-1.45	-3.80	0.91	0.228
Unemployment rate (%)					0.49	0.12	0.86	0.009
Intercept	54.2	51.7	56.7		54.3	51.8	56.7	

Continued

Table 2 Continued

Variance component	Model 1				Model 2			
	AME	95% CI		P	AME	95% CI		P
		Lower	Upper			Lower	Upper	
Level-1 (Individuals)	2.919		(-11.3%)		2.919		(-11.3%)	
Level-2 (Regions)	0.648		(-15.9%)		0.619		(-19.7%)	
Model information								
Deviance	25666.2				25659.6			
Wald test	p<0.001				p=0.009			

CI, Confidence interval; Ref, Reference category; Std, Standardised. N=20 974 employees in 232 European regions.

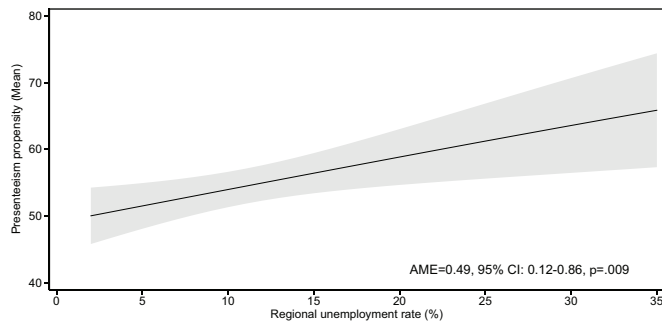


Figure 2 Predicted margins with 95% CI of presenteeism propensity by unemployment rate. Margins are based on the results of Model 2 in table 2. Margins are adjusted for age, gender, type of household, migration background, working hours, income, job tenure, occupational position, working sector, type of working contract, company size, trade union, number of days with illness and urbanisation. The average marginal effect (AME) indicates the average increase in the PP in percentage points by a change in unemployment of +1 percentage point.

differ between sectors. For example, healthcare workers have a strong belief that the own absence leads to higher workload among colleagues.³²

Overall, our findings support the discipline hypothesis and highlight the role of contextual factors in relation to attendance behaviour at work, specifically the regional level of unemployment.^{8 12} Future research could investigate other aspects, such as national policies of social protection or the level of sick pay or sickness benefits provided.

Strengths and limitations

Since registry-based data were not available, assessment of presenteeism in this study may suffer from reporting bias. However, as mentioned above, self-reports were found to provide satisfactory reliability and validity.²³ Second, the average response rate was moderate (43%) and varied across countries with very low rates in Sweden, Denmark and Finland. Respondents in these countries were recruited via telephone for face-to-face interviews, resulting in higher nonresponse.¹⁹ Although we did not find an indication that main results were driven by varying response rates, increase and variation of non-response is a growing problem in international surveys we cannot fully control for.

Strengths of this study are the use of a broad data set including a representative number of European countries and regions, which allowed us to draw more general conclusions than single-country studies could. A high number of regions also enhanced

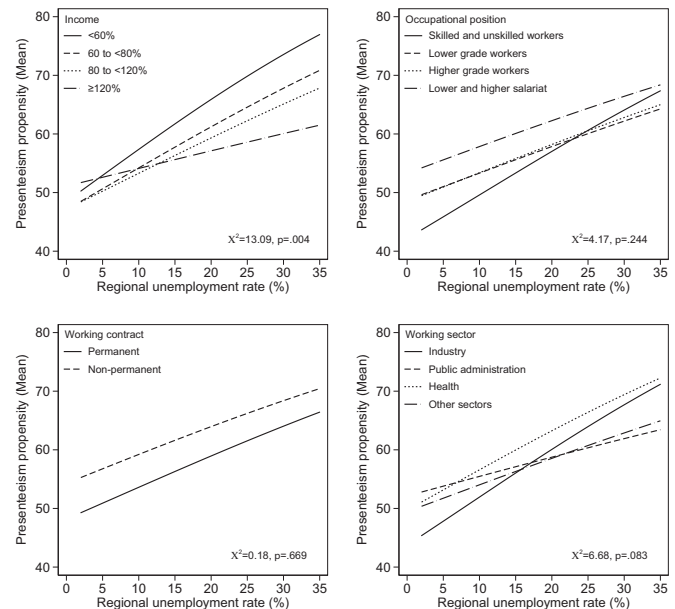


Figure 3 Predicted margins illustrating interactions between unemployment and occupational factors affecting presenteeism. Estimates are based on multi-level binomial regression simultaneously adjusted for other interactions with main effects, and age, gender, type of household, migration background, working hours, job tenure, working sector, company size, number of days with illness and degree of urbanisation. A Wald test was used to compare models with and without interactions in order to assess if the joint interaction significantly increased the model fit. Income was expressed as percent of country-specific median. Similar working sectors were summarised.

statistical power to analyse higher-level variation. The EWCS covers a wide range of aspects of working life, which allowed us to compare European regions adjusted for several sociodemographic and occupational factors. The presenteeism propensity is the state-of-the-art measure to analyse decision-based determinants of presenteeism.¹⁴

CONCLUSION

Workers avoid to be absent from work due to sickness and are more prone to work while sick when unemployment rates are high. However, people in disadvantaged jobs are particularly affected. Therefore, policies and guidelines on presenteeism should consider the role of the labour market context. Our findings may receive increased practical relevance in times during and after the COVID-19 pandemic, where increasing labour market insecurity may elevate the behaviour of presenteeism.

What is already known on this subject

- ▶ High local unemployment is associated with decreased sickness absence rates in cross-sectional and longitudinal studies.
- ▶ The discipline hypothesis assumes that individuals avoid taking sick leave when unemployment is high and the prospect for finding other work is low.
- ▶ Since no study has investigated this so far, we tested if high unemployment rates are associated with elevated sickness presenteeism.

What this study adds

- ▶ In a large sample of European employees from 232 regions, we found that individuals were more likely to choose presenteeism when regional unemployment rates were high.
- ▶ This association was most evident for workers with low income, low skill-level, and among industrial and healthcare workers.
- ▶ The labour market context should receive more attention when designing guidelines and policies managing presenteeism. This could be particularly important in times of the COVID-19 pandemic, where presenteeism can increase the spread of the virus in populations.

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