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Occupational Class Differences in Acute Mental-Health and Despair-Related Hospitalisations among the Labour Force in Finland 1990–2021

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Abstract

Purpose

To investigate periodic developments in acute mental disorder and despair-related hospitalisations of different occupational classes in the Finnish labour force between 1990 and 2021, and to study whether there is periodicity in the social gradient of these hospitalisations.

Methods

Eight representative cohorts (around 33% of the population) were linked to the hospital discharge registry data and followed up until 2021. Eight periods were recognized based on the prevalence of hospitalisations due to self-harm, mood disorders, neurotic disorders, psychotic disorders, and substance-use related psychoses and poisonings. Periodic trends in occupational class differences were studied using Firth's logistic regression stratified by gender.

Results

A social gradient persisted for mood disorders, neurotic disorders, non-organic psychoses, and drug poisonings among those in employment. Alcohol induced psychoses and poisonings decreased for all occupational groups while drug and medication related hospitalisations increased especially in the long-term unemployed group. Higher risk periods coincided with weaker national economy and the long-term unemployed group had the highest prevalence in all diagnoses studied.

Conclusion

Most of the studied diagnoses have clear periodicity and have become more prevalent in the late 2010s. Selection to employment has likely tightened while steady employment and income is protective of mental distress, contributing to the occupational class gradients.

Introduction

In the working-age population, mental disorders are a major public health concern. All mental disorders, but especially affective disorders – that is, mood disorders and neurotic disorders; often also called 'common mental disorders' – have become more prevalent in high-income countries since the 1990s.[1, 2] Socioeconomic differences in these mental disorders are common with lower income, and lower educational attainment generally being associated with a higher risk of mental disorder diagnosis.[3]

While depression has been shown to vary by occupation, in many studies both the definition of common mental disorders, and social determinants have been operationalised in variable ways making comparisons difficult.[4, 5] During recent decades lower occupational class has generally been associated with higher mental health risks. While women have been shown to have higher antidepressant use and more sickness absence days, men have a higher risk of suicide.[6–9]

It has been suggested that both the rise in mental disorders and the persistence of inequalities reflect deeper socioeconomic stressors.[10] The deaths of despair literature starting with Case and Deaton's 2015 article[11] argues that deaths due to drug overdose and alcohol-related liver diseases should be viewed as akin to suicide, and that this burden of death is highly socially patterned – affecting especially populations with low educational attainment and thus fewer economic opportunities[12–15]. A recent Canadian study similarly linked income inequality to "hospitalisations of despair"[16], suggesting that if certain groups are disproportionately affected by despair, this pattern should also appear in other severe outcomes beyond mortality.

As it is well-established that mental ill-health, alcohol or drug addiction, and self-harm or suicidal ideation are highly comorbid[17–23], these conditions may plausibly represent different expressions of the same underlying distress. The "despair behaviour" of alcohol- and drug-use is also socially patterned with drug-use-disorders (DUD) concentrating among people with lower socioeconomic status, at community level, and in countries experiencing high economic inequality or downshifts.[24] Alcohol use has become less prevalent in many countries, but the trend in the use of other substances is different[25]. While the burden of drug-use disorder on well-being has decreased globally between 1990 and 2021[26], DUD mortality has increased during the same time period and is estimated to continue to rise[27].

This study is based on the Finnish data. In Finland, recent decades have seen both a comparatively weakened economy and rising levels of sickness absence and disability pensions due to mental disorders.[28, 29] An earlier study has argued that widening differences in mental health hospitalisations by educational attainment in Finland – especially during the 1990s – were related to welfare state retrenchment and weaker employment opportunities. Mental health inequality rose especially among men.[30]

Overnight hospitalisations differ from the mental health or despair behaviour diagnoses leveraged in most studies in that they should be less sensitive to the changes in services and culture but more sensitive to the actual levels of severe mental distress in a population. For example, depression and anxiety are only treated in inpatient care if symptoms are sufficiently severe, acute, and functionally impairing that outpatient management is no longer considered safe or adequate. Acute hospitalisations therefore provide a valuable indicator of severe distress that is less influenced by diagnostic culture and help-seeking behaviour.

Aims of the study

The aim of this study is to investigate how hospitalisations for self-harm, acute mental disorders, and acute mental disorders and poisonings related to alcohol and other substances have affected women and men in different occupational classes at different times between 1990 and 2021. We aim to recognise differential periods in the occupational-class differences of these hospitalisations.

Methods

Study population

The study population was comprised of eight representative samples of the working-age population of Finland (33.3% sample at years 1987, 1992, 1997, 2001, 2004, 2007, 2010, and 2013) as part of the project "The rise of mental vulnerability: case of Finland".[6, 31] The study has been approved by the ethics committee of the Finnish Institute of Occupational Health, and is in line with the EU and Finnish data legislation. The register holders have given permissions for data linkage and use.

These sociodemographic data were linked in Statistics Finland with the individuals' income data from the income registry and hospitalisations from the Finnish Care Register for Healthcare using national ID numbers, individual identifiers of each permanent resident in Finland[32], pseudonymised for use in this study.

Duplicated person-years were omitted as the overlapping follow-up periods would lead to double counting. The final data included information on 3 686 402 individuals.

The yearly data were aggregated to eight periods based on the preliminary yearly graphs (Appendix 1) and general information on economically interesting periods such as the 1990s' depression, the Great Recession of late 00s, and the Covid-19 pandemic years: 1990–1995, 1996–1999, 2000–2004, 2005–2006, 2007–2009, 2010–2013, 2014–2018, and finally 2019–2021.

Administrative hospitalisation data

The Finnish Institute for Health and Welfare collects data on all hospital visits in Finland. From 1987 to 1995 the diagnoses codes in the then-called Hospital Discharge Registry[33] (later Care Register for Health Care[34]) used a Finnish modification of the ICD-9 categorisation of diseases.[35] Since 1996, the diagnoses have been coded based on ICD-10.[36] (Table 1.) The abbreviations in Table 1 are used throughout the figures and tables of this article.

Table 1
Classification of hospitalisation diagnoses by time-period.

Cause	ICD-9 (1990–1995)	ICD-10 (1996–2021)	Abbreviation
Mood disorders	296 Severe mood disorders	F30–F39 Mood disorders	MoodDis
Neurotic disorders	300 Neuroses	F40–F48 Neurotic, stress-related and somatoform disorders	NeurDis
Psychotic disorders (non-organic, non-substance-induced)	295 Schizophrenic disorders, 297 Paranoid states, 298 Other non-organic psychoses, (excl. 299 childhood-onset)	F20–F29 Schizophrenia, schizotypal and delusional disorders	Psy
Organic brain syndromes caused by alcohol	291Alcohol-induced mental disorders	F10.5–F10.9, Psychotic disorder or other organic brain syndrome due to use of alcohol (excl. intoxication, harmful use)	AlcoPsy
Organic brain syndromes caused by drugs or intoxicating substances (incl. medications)	292 Drug-induced mental disorders	F11.5–F19.9 Psychotic disorders and other organic brain syndromes caused by drugs and substances (excl. intoxication, harmful use, F17 tobacco)	DrugPsy
Alcohol poisonings	980 (all alcohols)	T51 Toxic effect of alcohol	Alco
Drug poisonings (including medications)	960–979 Drug, medication, and other poisonings	T36, T40, T50 Poisoning by psychotropic agents, drugs and biological substances	Drug
Self-harm	E95 (known to be self-caused), E97 (cause not certain), neither used due to low n	X60 – X84 Intentional self-harm, Z91.5 earlier self-injury	Self-harm

The causes of hospitalisations were coded based on the registers' fields for primary and side diagnoses. The outcomes studied were selected based on their acute nature and plausible relationship with psychological distress or despair behaviour. Mood disorders included severe mood disorders (296) during ICD-9 and F30–F39 during ICD-10, neurotic disorders 300 and F40–F48. Only psychotic disorders where there was not an organic reason – such as brain damage – were included, and childhood onset disorders were excluded. Substance-use related psychoses were separated from non-organic disorders, but intoxication and harmful use were excluded as they might represent hospitalisations for other reasons with co-existing less acute DUD. Self-harm was not used for the period 1990–1995 due to low number of diagnoses in the data.

Hospitalisations were calculated by year of entry to inpatient care. If a record was missing the entry time but included information on discharge time, this was used instead. Overlapping episodes were handled following the most conservative strategy described by Suokas et. al.[37]: hospitalisations that did not involve an overnight stay were classified as outpatient visits and were not included in the event counts; there had to also be at least one full day out of hospital for a hospitalisation to be considered new and not a continuation of the previous episode. When hospitalisations were aggregated to periods spanning multiple years, having a hospitalisation in any of the years in the period was considered a hospitalisation event.

Covariates

For person-years with events, background characteristics were collected from the Statistics Finland dataset to match the statistical year before each observation's year due to the time-varying nature of occupational class, family structure, and

income. The census data represents a person's situation at the end of the year, but after hospitalisation a person's employment status and income may change. For those with no events, end-of-year data was deemed sufficient.

Years spent as students, conscripts or conscientious objectors, on any form of pension, or otherwise outside the workforce were excluded based on Statistics Finland's classification of main activity[38], as these groups are either in transitional life phases or no longer part of the labour market and therefore fall outside the study framework.

As background data was not available for years 2020 and 2021, the end-of-year data from 2019 was used. Classification into occupational classes was also not available for years 1991, 1992, 1994, 1996–1999, and 2001–2003. This was addressed by imputing the occupational class from the last known year. While this might cause some misclassification, the choice should lead to more conservative rather than overstated estimates.

List of variables:

- To account for different life-phases, age was classified into three groups: 25–39, 40–54, and 55–64. Person-years when an individual was younger or older than this were omitted.
- Administrative sex – meaning the sex recorded into the Finnish Population Information System – was used. Sex in the system can be recorded only as male or female, with persons of a third or unclassified gender registered abroad being recorded as female.[39]
- Occupational class was classified into managers and professionals, lower non-manual employees, manual employees, and long-term unemployed based on the Statistics Finland classification of socioeconomic groups. According to the classification those unemployed for over 6 months of the census year were termed long-term unemployed, except for 1990–1994 when the census still used employment status at the end of year.[40] Other socioeconomic groups were omitted.
- The occupational class was assumed to stay the same during unemployment, months of which per year were recoded to a binary variable: yes or no unemployment during the period.
- Marital status had four categories: unmarried, married, divorced or widowed. Same-sex marriages and registered partnerships were included in the married category as in the Finnish Population Information System.[41] Cohabitation was not accounted for.
- Total income and wage earnings were based on government taxable values. Wage earnings were recoded to year-specific quartiles in the dataset with men and women together and aggregated to the most frequent quartile per individual during a period. Capital income was calculated by subtracting wage earnings from total taxable income and recoded to a binary variable: any or no capital income during the period.

Table 2. Sample characteristics at individuals entry into study (n=3 686 402).

Characteristic	Category	Women	Men
		n (%)	n (%)
Age at entry to study	25–39	1,173,970 (64%)	1,223,063 (66%)
	40–54	514,784 (28%)	487,228 (26%)
	55–64	148,931 (8%)	138,426 (7%)
Initial occupational class	Manual	405,210 (22%)	804,585 (44%)
	Lower non-manual	850,495 (46%)	398,971 (22%)
	Managerial/professional	304,030 (17%)	329,226 (18%)
	Long-term unemployed*	277,950 (15%)	315,935 (17%)
Initial marital status	Unmarried	757,959 (41%)	949,581 (51%)
	Married	875,061 (48%)	760,523 (41%)
	Divorced	174,085 (9%)	(7%)
	Widowed	30,580 (2%)	6563 (0%)
Unemployment (yes)		603,395 (33%)	638,776 (35%)
Wage quartile	I (lowest)	784,272 (43%)	573,998 (31%)
	II	530,202 (29%)	370,937 (20%)
	III	342,725 (19%)	446,802 (24%)
	IV (highest)	180,486 (10%)	456,980 (25%)
Capital income (yes)		576,394 (31%)	624,301 (34%)

* For 1990–1994 this is unemployed during the census week.
SD: standard deviation.

Statistical analysis

Hospitalisation records were aggregated into eight periods based on yearly prevalence trends and key economic and societal shifts. To model these trends, we employed Firth's penalized logistic regression. The approach was selected to ensure model convergence despite the rarity of outcomes and the potential for quasi-complete separation.[42, 43].

Data were prepared and the analysis performed using R version 4.4.1[44], and the logistf[45] and marginaleffects[46] packages. All analyses were stratified by sex.

Results

Line graphs of yearly and periodic crude rates of different hospitalizations by gender and occupational class are included in Appendices 1 and 2. Only 3.2% of individuals had ever had any of the studied hospitalisations with the most common hospitalisations being due to mood disorders (58,860 events; 1.7%) and the rarest being diagnosed self-harm with 356 (0.01%) hospitalisations during the 31-year follow-up.

Mood, neurotic and psychotic disorders

Mood disorders were the most common hospitalisation reason in both women and men, followed by (non-organic) psychoses and neuroses. Among employed individuals, a consistent social gradient was observed for both women and men: manual employees (reference group) had the highest predicted risks, followed by lower non-manual and managerial/professional groups. This gradient was statistically significant across most periods for mood disorders, neurotic disorders, and psychoses. (Fig. 1.) The gradient between manual employees and managers and professionals has widened in the 2010s (Appendix 3).

Hospitalisation risks declined in the mid-to-late 2000s but rose again in the 2010s, particularly among women. For female manual and lower non-manual employees, mood disorder risks doubled between 2005–2006 and 2014–2018. Psychotic disorder hospitalisations also increased among manual women, though not to the levels seen in 1996–1999.

Substance use related hospitalisations

In substance use related hospitalisations, drug poisoning was the most common diagnosis and alcohol poisoning the least. Substance-related hospitalisations decreased after the 1990s. The social gradient between the employed groups disappeared for alcohol poisoning and alcohol psychosis but persisted for drug poisonings and even increased for male drug psychosis hospitalisations. (Fig. 1.)

Long-term unemployed vs employed groups

To show the difference between the long-term unemployed and the employed groups, the long-term unemployed were compared to the manual employees – the most high-risk group in the employed groups. Due to the scale differences a separate figure (Fig. 2) was used to show these as the occupational class differences in Fig. 1 would not be discernable if the long-term unemployed were included in the same graphs.

All studied hospitalisations, including psychoses, were most prevalent among the long-term unemployed. The social gradient increased towards 2019–2021, except for alcohol-related psychoses and poisonings, where the differences between the long-term unemployed and the employed classes narrowed. Especially steep relative increases were seen in psychotic and drug-related psychotic hospitalisations of long-term unemployed men. (Fig. 2.)

Self-harm hospitalisations

Self-harm hospitalisations followed a similar “bottom-U” shaped trend in all studied groups: the risk decreased from the 1990s to negligible levels in the mid-00s and started to rise again in the 2010s. For women, the periodic occupational class differences were statistically significant only between the long-term unemployed in 1996–1999, 2014–2018, and 2019–2021 compared to manual employees. For men, the differences were statistically significant also in 1996–1999, 2014–2018, and 2019–2021. In 2019–2021 over 20 per 100,000 long-term unemployed women and nearly 30 per 100,000 long-term unemployed men had a self-harm hospitalisation. (Fig. 2, Appendix 2).

Adjusted models and attenuation of occupational class differences

Adjusting for covariates – age, marital status, unemployment months, wage quartile, and access to capital income – attenuated the occupational class differences. Figure 3 shows the periodic occupational class differences for three different causes of hospitalisation: mood disorders, psychosis, and drug poisonings.

Table 3 summarises the marginal odds ratios for these three outcomes, comparing unadjusted and adjusted models. Estimates were averaged across all eight periods. The percentage attenuation quantifies the extent to which occupational class differences are explained by the added covariates. A similar attenuation table for all eight outcomes is available in Appendix 4.

In the fully adjusted models, all occupational class differences were substantially reduced, and the temporal patterns for mood disorders and psychosis were broadly similar across all socioeconomic groups, except for 2019–2021 where long-

term unemployed had increased risks (Fig. 3). Most adjusted differences were small and often statistically non-significant.

Two notable reversals emerged: the managerial and professional group had the highest adjusted risks of mood disorder hospitalisations in both women and men in the 1990s and 2000–2004, and the highest adjusted risks of psychosis hospitalisations among women in 1996–1999. These patterns are consistent with the marginal odds ratios in Table 3, where adjustment reduced or reversed the crude SES gradients for these outcomes.

For drug poisonings, adjustment attenuated the differences between manual employees and long-term unemployed, but the adjusted risk remained statistically significantly lower for managers and professionals than for manual employees after 2005–2006. Among women in the 2010s, both manual employees and long-term unemployed also had a higher adjusted risks of drug poisoning than non-manual employees. (Fig. 3.)

Overall, the adjusted models suggest that much of the crude socioeconomic patterning was explained by the included socio-demographic covariates, although some small and outcome-specific differences persisted. (Fig. 3, Table 3, Appendix 4.)

Table 3
Overall socioeconomic contrasts and attenuation based on marginal odds ratios averaged across periods. Marginal odds ratios were computed from models including SES × period interactions by averaging predicted probabilities across all periods for each SES difference before and after adjusting for age, marital status, unemployment, and wage and capital income. MoodDis = mood disorders; Psy = psychosis; Drug = drug poisoning.

		Women			Men		
Outcome	Class compared to manual employees	Unadjusted OR	Adjusted OR	Attenuation	Unadjusted OR	Adjusted OR	Attenuation
MoodDis	Managerial/professional	0.69 (0.6–0.78)	1.02 (0.88–1.17)	105%	0.7 (0.62–0.8)	1.06 (0.92–1.22)	120%
	Long-term unemployed	1.73 (1.53–1.94)	1.22 (1.07–1.39)	70%	2.19 (1.98–2.41)	1.08 (0.96–1.21)	93%
Psy	Managerial/professional	0.54 (0.42–0.68)	0.88 (0.68–1.12)	73%	0.53 (0.41–0.65)	0.89 (0.69–1.12)	77%
	Long-term unemployed	2.3 (1.92–2.75)	1.52 (1.24–1.86)	60%	3.44 (2.98–3.97)	1.71 (1.44–2.02)	71%
Drug	Managerial/professional	0.36 (0.27–0.47)	0.52 (0.38–0.7)	26%	0.33 (0.24–0.44)	0.54 (0.38–0.74)	32%
	Long-term unemployed	1.94 (1.59–2.37)	1.16 (0.93–1.46)	82%	3.25 (2.75–3.83)	1.4 (1.14–1.71)	82%

Discussion

This study aimed to find differential periods in the occupational class differences in mental disorder and despair related hospitalisations between 1990 and 2021 in the Finnish labour force. Among the employed, a consistent social gradient was present in mood disorders, neurotic disorders, non-organic psychoses, and drug poisonings with manual employees having the highest risk of hospitalisation. The prevalences of these outcomes were higher in women than in men.

Most outcomes showed a clear rise in the 2010s, whereas alcohol-related hospitalisations remained low among the employed groups after the early 2000s. Although occupational class differences were largely attenuated after adjusting for age, marital status, unemployment months, wage quartile, and capital income, the temporal patterns remained striking. The

parallel rise across several diagnostic categories suggests shared underlying pathways linked to social connectedness, age, and income.

Serious mental disorders are associated with lower prior income before a diagnosis and decreases of wage income after a diagnosis.[47] The relationship of mental disorders and poverty is bidirectional with negative income shocks worsening mental health but mental disorders also weakening one's capability to earn a living.[10, 48] Lower socioeconomic position is consistently associated with reduced access to mental health care and lower benefit from interventions[16]. Individuals with higher income or wealth can access private services and employer provided benefits, while higher educational attainment often confers greater knowledge and social capital for navigating public services.[49]

The rise in working-age mental disorders in high-income countries might be driven more by, e.g., care service development and cultural practices around mental health, rather than any underlying increases in 'distress' or 'despair'. Social inequalities in these outcomes have been shown to be sensitive to the socioeconomic contexts and policies that change over time.[50] In addition, non-measurable cultural norms are likely to contribute, e.g., help-seeking behaviour and what kind of coping strategies are available for different socio-economic groups.[51, 52]

Nevertheless, the high levels of the studied hospitalisations in the early 1990s are temporally associated with the deep economic depression[53] in Finland, and the rise in hospitalisations in the 2010s coincides with a long stagnation[54] of the Finnish economy and the latest years coincide with the Covid-19 pandemic that has been shown to have had negative mental health and employment effects in the general population[55, 56]. The highest prevalences of the hospitalisations were found for the long-term unemployed, the most economically disadvantaged group.

Thus, the widening gap between employed groups and the long-term unemployed in several outcomes likely reflects increasing selection into unemployment, where individuals with accumulating mental health or substance use problems have fewer opportunities to remain in or to return to work. This interpretation is consistent with Kokkinen et al.'s findings on mental health hospitalisations from 1976 to 2010.[30]

While Ruhm[57] has argued that Case and Deaton's conceptualisation of despair [12] lacks definitional precision, our findings support the value of examining hospitalisations that are sensitive to periodic socioeconomic changes. The divergence between alcohol- and drug-related outcomes is consistent with Tilstra's critique that these categories should not be grouped together[58] – as is commonly done. National and international evidence of declining alcohol consumption but rising drug- and medication-related harms reinforces this interpretation.

Substance-use is generally at least as common in wealthier groups, but harms concentrate more on the more vulnerable populations.[24, 27, 59] Our results showed that alcohol poisonings are still relatively high among the long-term unemployed men, but otherwise alcohol-related hospitalisations have declined while drug psychoses have not. Drug poisonings and psychoses have even increased in long-term unemployed men and women. This suggests both a partial substitution of substances used from alcohol to other substances over time, and that the increased demands of working life might mean that substance abuse is more often associated with unemployment or exit from the labour market than before. While risky alcohol use has been shown to be quite common in the working age population (even a third of male manual employees in Finland are risk users based on AUDIT-C[60]), our results suggest a socioeconomic difference in the degree of risky use not captured by commonly used risk indicators. This novel result shows that the more extreme outcome – hospitalisation – is even more strongly socioeconomically patterned.

Changes in mental health care provision may also contribute to the observed trends. In many countries the deinstitutionalisation of mental health services and budget cuts have decreased the number of beds in psychiatric wards[61–64]. Shifts in primary care capacity, thresholds for specialist inpatient care, and the availability of early intervention services can influence who is hospitalised and when. National programmes aimed at improving mental health services may also have altered help seeking pathways, potentially reducing some hospitalisations while increasing others as patient situations escalate before reaching effective care.

Overnight hospitalisations with acute mental health and substance related diagnoses represent a severe end of the distress spectrum—a “peak-of-the-iceberg” manifestation of psychological strain and despair. Diagosed self-harm was extremely rare. This rarity likely reflects substantial underdiagnosis of self-harm in administrative data rather than true absence of self-harming behaviour.

Methodological considerations

This study has several strengths. First, register-based studies have seldom examined such rare outcomes in a general working-age population, making these findings an important contribution to the understanding severe episodes of distress among those still connected to the labour market. Second, the study period – spanning over three decades – uniquely allows for the study of these trends over time. Third, limiting the analysis to clearly acute diagnoses and analysing each of these outcomes seperately allows differential trends to be revealed.

Nevertheless, there are some limitations. First, the measures used in this study were coarse, and the model estimates should thus be interpreted as indicative rather than exact. Second, we studied only overnight hospitalisations. Emergency department visits, outpatient contacts, and social service encounters were not captured. While focusing on overnight admissions highlights acute and severe “crisis” situations, future research should integrate both overnight and less intensive service use to provide a more complete and gradual picture of mental distress related care. Ideally different levels of acuteness could be included in a single study.

Third, while we did not focus here on the effects of wage income, capital income, and family structure, the estimates in Appendix 3 (adjusted models only) suggest protective effects on many of the studied hospitalisations. Alternative classifications of age or occupational class may also further clarify their associations with hospitalisations. An earlier study found that low income has been shown to be more strongly associated with mental disorders in the Finnish labour force than education or occupation, but they pooled social benefit beneficiaries and did not distinguish the unemployed[65], who had the highest risks in our study.

Finally, the shared social etiology underlying differences between socioeconomic groups warrants deeper investigation. Linking inpatient data with outpatient, emergency, and social care records – and exploiting policy or economic shocks – would help disentangle causal pathways from selection processes and provide a more comprehensive understanding of distress related behaviour in the workforce as suggested by Alegría et al.[66]

Noting the severity of the care situations, overnight hospitalisations for acute mental-health and substance-related conditions, when contrasted with the very small number of diagnosed self-harm events, suggest that self-harm is likely underdiagnosed in routine clinical practice. The development of specific self-harm registers and clearer diagnostic criteria—already underway in several countries—should be advanced to improve surveillance and to better understand the shared social etiology underlying these severe outcomes.[67]

Conclusions

Overnight hospitalisations for acute mental disorders and substance-related poisonings and psychoses had an occupational class gradient for most of the periods between 1990 and 2021. The gradient widened during weaker economic periods and decreased in the mid-00s, except for alcohol-related hospitalisations, which decreased in all occupational classes.

The gradient between the employed classes and long-term unemployed widened after the mid-00s except for alchol-related hospitalisations. This suggests a protective effect of employment or selection processes into unemployment. The vicious cycles of unemployment, mental ill-health, and self-harming behaviour should be addressed by health and social policies.

Declarations

Competing interests

None declared.

Author Contribution

All authors jointly contributed to the conception and design of the study. A.V. contributed to the acquisition of the data. S.R. implemented the statistical analysis, prepared the figures and tables, and drafted the article. A.K. , and A.V. contributed to interpreting findings, reviewing the article, and revising it critically for important intellectual content.

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Data Availability

Data in this study were used under a license approved by Statistics Finland and The Finnish Social and Health Data Permit Authority (Findata). The data are not publicly available. Findata coordinates the permissions for similar datasets, and they are available to researchers under permission (https://findata.fi/en/).

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Figures

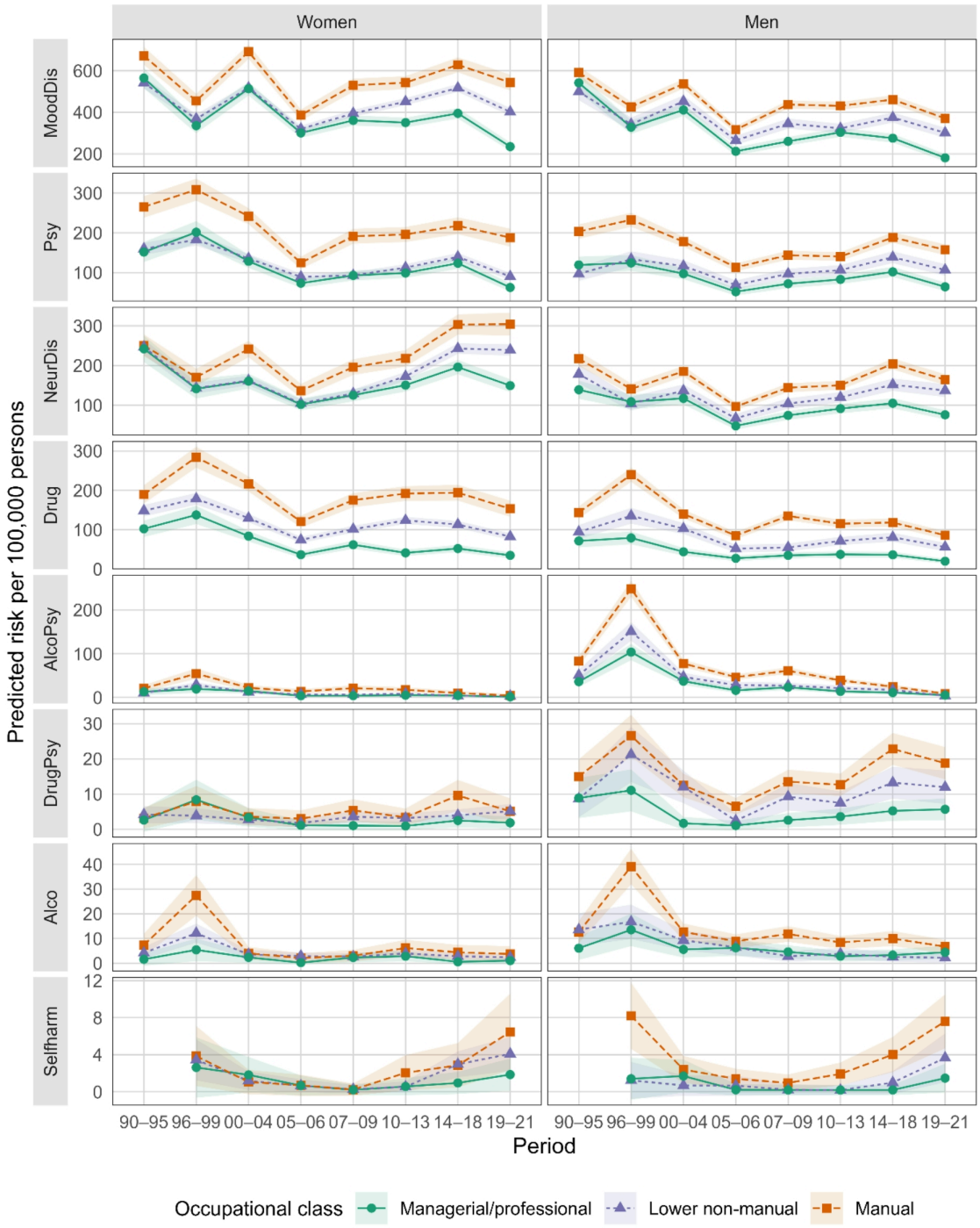


Figure 1

Occupational class differences in overnight hospitalisation risks between occupational classes among the employed population. Predicted probabilities from Firth's logistic regression, unadjusted models: Occupational class × Period. MoodDis = mood disorders; Psy = psychosis, NeurDis = neurotic disorders; Drug = drug poisoning; AlcoPsy = alcohol psychosis; DrugPsy = drug-use related psychosis; Alco = alcohol poisoning; Self-harm = self-harm.

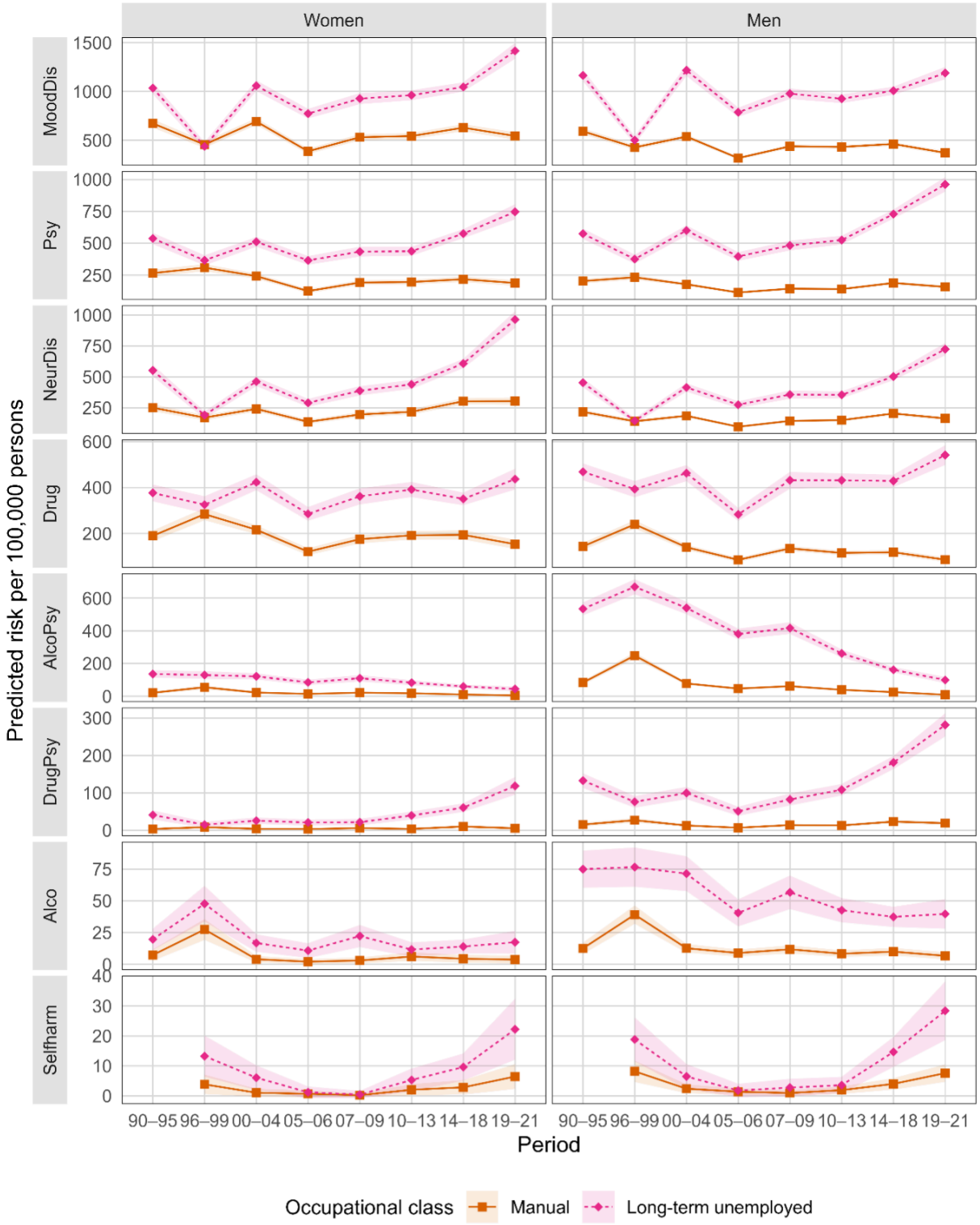


Figure 2

Differences in overnight hospitalisation risks between long-term unemployed and manual employees. Predicted probabilities from Firth's logistic regression, unadjusted models: Occupational class × Period. MoodDis = mood disorders; Psy = psychosis, NeurDis = neurotic disorders; Drug = drug poisoning; AlcoPsy = alcohol psychosis; DrugPsy = drug-use related psychosis; Alco = alcohol poisoning; Self-harm = self-harm.

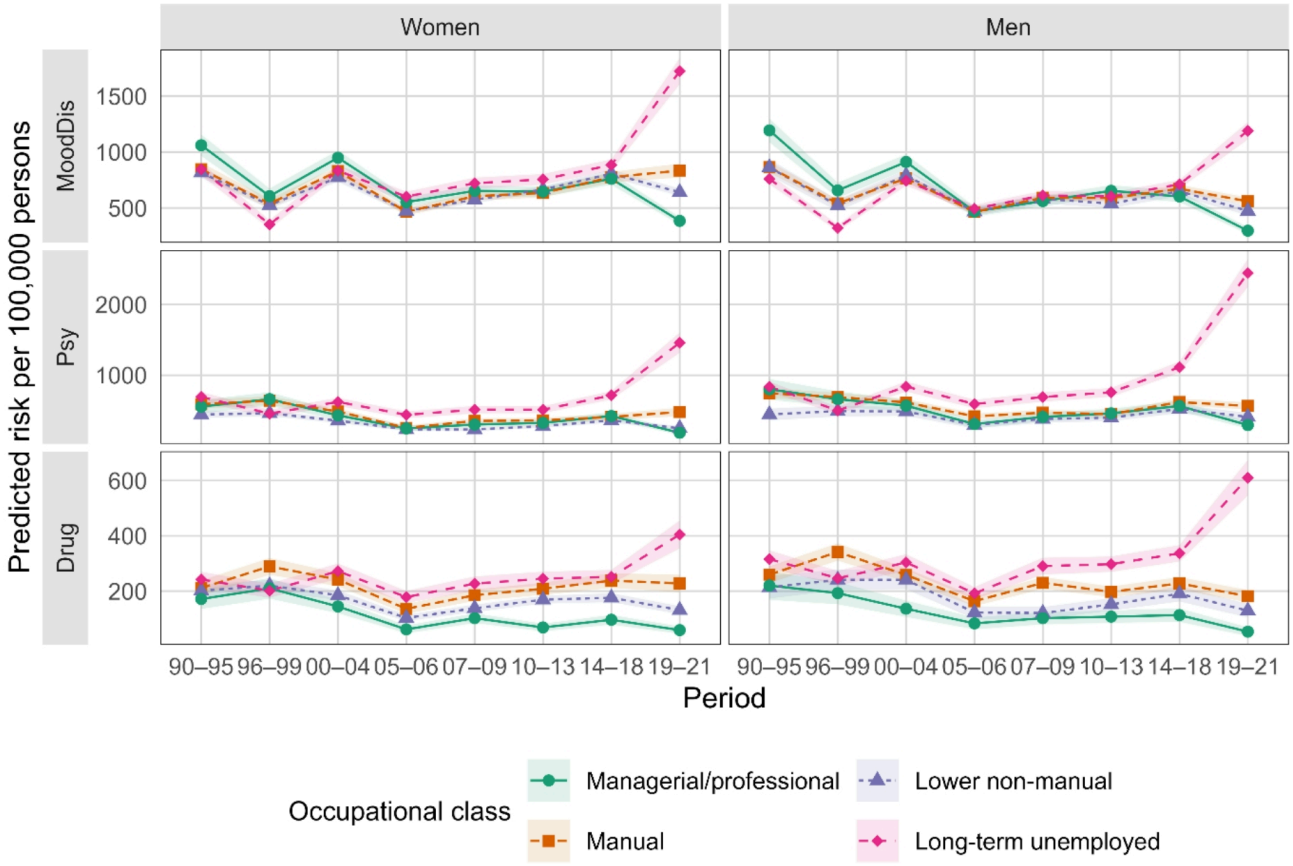


Figure 3

Predicted risk per 100,000 persons (95% CI) from fully adjusted models. Values represent predicted hospitalisation risk for each socioeconomic group, stratified by gender and period. Estimates are derived from Firth's logistic regression models including Occupational class × period interactions adjusted for age, marital status, unemployment months, and income. MoodDis = mood disorders; Psy = psychosis, Drug = drug poisoning.

Supplementary Files

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- HospitalisationsofDespairAppendices.docx