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Abstract

The burden of mental disorders continues to grow and is now a leading cause of disability worldwide. The prevalence of mental disorders is unequal between population subgroups, and these disorders are associated with unfavourable consequences in social and economic conditions, health and survival. However, how the negative effects of mental disorders are distributed among population subgroups is less studied. Our aim is to investigate how labour market consequences of Common Mental Disorders (CMD) differ over gender, age, education, and country of birth. We use a population sample from southern Sweden of patients diagnosed with CMD 2009-2012 and a matched general population control group with linked register information on employment, long-term sick leave, and disability pension. Logistic regression with interaction effects between CMD and sociodemographic indicators are used to estimate labour market consequences of CMD in the different population subgroups. CMD have a negative impact on all labour market outcomes studied, reducing employment while increasing the risk of long term sick leave and disability pension. However, the associated effect is found to be stronger for men than women, except for disability pension where consequences are similar. Surprisingly, high educated individuals suffer worse labour market consequences than low educated. Consequences of CMD in labour market outcomes are not consistent across different age-groups and country of birth. Inequalities in the labour market consequences of common mental disorders sometimes contributes to, and sometimes mitigates, societal inequalities in employment, long term sick leave and disability pension. When developing new strategies to tackle mental ill health in the population, it may therefore be motivated to consider not only inequalities in the prevalence of mental disorders, but also inequalities in the consequences of these disorders.

JEL: I10, I14, J01

Key words: Mental health, Inequality, Employment, Labour market

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Background

Overall population health indicators measured by life expectancy and healthy life expectancy are improving globally (WHO, 2016). Yet, the burden of mental disorders continues to grow, around 300 million people in the world are affected by depression and nearly as many suffer from anxiety (WHO, 2017). Depression is the third leading cause of disability in Sweden (IHME, 2017), and more than one third of the Swedish population experienced some level of anxiety in 2016 (Folkhälsomyndigheten, 2017).

Mental ill health affects the entire population irrespective of sex, age and socioeconomic status (SES). Yet, prevalence is not equally distributed among all population subgroups. Women and low-educated individuals are more likely to suffer from mental disorders than men and high-educated individuals (Rai et al., 2013). Migration status has been found both positively (Dhadda & Greene, 2017) and negatively (Lindert et al., 2008) associated with mental health, and the prevalence of mental disorders appear to decrease with age (Kessler et al., 2010).

A large body of literature link mental ill health with adverse outcomes in several aspects of life. For example, childhood and adolescent depression are associated with fewer years of schooling (J. M. Fletcher, 2010) and lower probabilities of graduation from higher education (Jonsson et al., 2010), which affects opportunities of human capital accumulation and future earnings (Angrist & Krueger, 1991; Duflo, 2001). Individuals with mental ill health have poorer labour market outcomes compared to healthy individuals (J. Fletcher, 2013). Mental disorders are associated with co-morbidities and several chronic diseases (Batelaan et al., 2016; Diniz et al., 2013; Yu et al., 2015). Moreover, depression reduces overall quality of life (Riihimaki et al., 2016) and increases premature death (Cuijpers & Schoevers, 2004).

Thus, it is known that the prevalence of mental disorders is unequal between population subgroups, and that these disorders are associated with unfavourable consequences in social and economic living conditions, health and survival. However, less is known on how the negative effects of mental disorders are distributed among population subgroups, that is, if the consequences of these disorders differ in magnitude between men and women, and over different age-groups, ethnicities and SESs.

The existing research in this area has established robust relationships between mental ill health and adverse outcomes in social and economic living conditions, as well as in other health outcomes. However, earlier research mainly study how consequences of mental ill health differ between men and women, and allow for variation by SES, age and ethnicity in

relatively few cases. Individuals with mental ill health are more often absent from work due to sickness or disability (Dorner et al., 2015; Knudsen et al., 2013; Koopmans et al., 2010; Lassemo et al., 2016; Lexis et al., 2009; Wedegaertner et al., 2013), are more unemployed (Andreeva et al., 2015; J. Fletcher, 2013; Whooley et al., 2002a), and earn less (J. Fletcher, 2013; Hakulinen et al., 2016; Whooley et al., 2002a), compared to healthy individuals. However, it appears as though men and women, and individuals from different SES, are affected to a varying extent. International studies indicate that rates of sickness absence are similar between depressed men and women (Knudsen et al., 2013; Koopmans et al., 2010; Lexis et al., 2009), but men with depression are on disability pension more often than depressed women (Dorner et al., 2015; Lassemo et al., 2016; Wedegaertner et al., 2013). Income loss due to depression is also more profound in men than women (J. Fletcher, 2013; Hakulinen et al., 2016). Moreover, both men (Whooley et al., 2002a) and women (Andreeva et al., 2015; J. Fletcher, 2013) have been found to be disadvantaged in the relationship between mental disorders and unemployment. Earlier research further show that a socioeconomic gradient affects the relationship between mental ill health and absence from the labour market due to sickness or disability, such that those with low SES are more absent (Ervasti et al., 2013; Virtanen et al., 2011). In one study it was also found that the consequences of a common mental disorder in sickness absence decreased significantly with age, at least among women (Koopmans et al., 2010).

Although research in this area study variations between men and women to some extent, very few studies stratify their findings by SES, age or ethnicity. With the current study, we try to fill this research gap. Our purpose is to investigate how the consequences of a diagnosis for Common Mental Disorders (CMD) on labour market outcomes differ over sex, age, SES and country of birth.

Theoretical background

We apply a model on the determinants of health inequalities developed by (Diderichsen et al., 2012) to understand the causal links between social position (determined by sex, SES, age and ethnicity) and differences in the consequences of mental disorders (Figure 1).

<< Figure 1 >>

According to (Diderichsen et al., 2012), several determinants impact on an individual's health, both directly and indirectly. In short, background factors related to heritage, early development, education and ethnicity create a range of social positions (Figure 1 arrow I). Social position is related to several environmental factors such as residential conditions and employment conditions, as well as behavioural factors such as choices of lifestyle and attitudes towards health care/treatment. Social position acts synergistically with the societal context and cause differences between population subgroups in the exposure and vulnerability to risk factors for mental disorders, as well as differences in the consequences of these disorders. For example, it is possible that precarious employment conditions among low-educated increases the risk for CMD and cause differences in the exposure to these disorders (Figure 1 arrow II). It is also possible that different risk factors, for example precarious employment conditions in combination with poor physical health, interact with each other and cause differences in the vulnerability to a similar exposure between different population subgroups (Figure 1 arrow III). Moreover, it is possible that precarious employment conditions or poor health among low-educated increases the risk of unemployment due to CMD, which could cause an unequal distribution of the consequences of mental disorders between different population subgroups (Figure 1 arrow IV). In turn, differences in the consequences of CMD lead to further social stratification through adverse outcomes in social and economic living conditions and health among the disadvantaged (Figure 1 arrow V). The framework identifies four policy entry points to address these inequalities (Figure 1 arrow A-D). Health inequalities can be intervened by acting on social stratification (A), reducing the exposure and vulnerability to ill health among the disadvantaged (B, C), or levelling the consequences of ill health among different population subgroups (D). If consequences of mental ill health differ across sex, SES, age and ethnicity, it could create additional inequalities in labour market outcomes. Thus, understanding more about the link between social position and consequences of mental disorders is important,

such that social and mental health care policies can be developed to counteract inequalities in society.

Method

In this study, we employ a dataset containing all individuals who received a diagnosis of CMD in outpatient care in Region Skåne, Sweden during the period 2009-2012 (see Supplementary material for a more detailed description of the dataset). CMDs are defined to include the following diagnoses (ICD-10 code): depressive episode (F32), recurrent depressive episode (F33), phobic anxiety disorders (F40), panic disorders (F410), generalised anxiety disorder (F411), unspecified anxiety disorder (F419), obsessive-compulsive disorder (F42), post-traumatic stress disorder (F431), other reactions to severe stress (F438), unspecified reaction to severe stress (F439). Individuals with psychiatric inpatient episodes are excluded. The sample is limited to individuals aged 20-59 years at the time of diagnosis to make sure that the included individuals does not reach retirement age during the follow-up years.

A control group was matched to the cases from a general population sample where all individuals with a diagnosis of CMD during 2009-2012 according to the inpatient- and outpatient registers from the National Board of Health and Welfare were excluded. A nearest neighbour 1:1 propensity score matching approach without replacement and a maximum caliper of 0.001 was applied. The propensity score was based on sex, age, education and country of birth. Unmatched individuals were dropped from the analysis, leaving a final sample of 76,946. The start point of analysis for the control group was set to year 2010 as this corresponds to the year with the highest proportion of diagnosis among the cases.

For all included observations (cases and controls), yearly information for the year 2008-2013 from the Integrated Database for Labour Market Research was added (SCB, 2016). This includes data on our labour market outcomes (employment, disability pension and sick leave) as well as demographic and socioeconomic variables. Employment follows the definition used by Statistics Sweden and is measured as being employed during the month of November each year. Long term sick leave is defined as having at least one case of sickness absence longer than 14 days. It is only after 14 days that a sick leave is reported to the Social Insurance Agency and thus becomes included in the Swedish registers. Also, non-employed individuals who are registered as job-seekers can be registered as absent due to sickness by the Social Insurance Agency. The analyses therefore include the full working aged sample and the variable is coded as 1 if the individual has at least one episode of long term sick leave during the follow-up years, and 0 otherwise. In Sweden, disability pension (actually "sickness- and activity compensation" but referred to as "disability pension" in the current

study) can be granted on full or part time and is regularly re-evaluated with the goal that the individual returns to work. An individual is defined as on disability pension (=1) if s/he at any time during the follow-up is on disability pension (full or part time), and 0 otherwise. Thus, the labour market outcomes are not mutually exclusive and an individual can, in theory, be defined as employed, on sick leave and on disability pension at the same time. To facilitate interpretation of the analyses, the inverse of employment is used, i.e. non-employment is equal to 1 if not employed during at least one of the three follow-up years, and 0 otherwise.

Our main focus is to study how consequences of CMD differ over sex, age, SES and country of birth. Sex is divided into male and female and age is categorised into four groups (20-29, 30-39, 40-49, and 50-59 years). SES is measured by education and divided into three categories following the Swedish schooling system (mandatory education ≤9 years, secondary education 10-12 years, and higher education ≥13 years). Country of birth is dichotomised into born in Sweden vs. born outside Sweden.

Statistical analyses

Estimating the relationship between mental health and labour market outcomes is complicated by several issues. The first issue is related to reversed causality since it is likely that the relationships between mental disorders and labour market outcomes are reciprocal. The second issue is related to unobserved heterogeneity. It is possible that individuals who suffer from mental disorders differ from healthy individuals in unobserved ways. For example, if individuals who are exposed to mental disorders have weaker attachment to the labour force than mentally healthy individuals, there would be a selection problem. Due to these issues, it is complicated to draw causal inferences from observed differences in the studied labour market outcomes between individuals with and without CMDs. In this study, we use propensity score matching to create a control group and estimate the effect of CMDs on labour market outcomes. We use this method to achieve exogenous variation of the outcomes between the case and control groups. To address the issue of reversed causality, we control for the outcomes one year before diagnosis of CMD.

Potential differences between cases and controls are studied in univariate analyses using t- and Chi2 test. The consequences of diagnosis over the follow-up period are described and shown graphically, in total and separately for men and women, by age groups, education and country of birth. Logistic regression analyses with interaction terms between diagnosis of

CMD and sex, age, education and country of birth are also performed. The interaction effects, for example between diagnosis and sex, shows the difference in association between diagnosis and the outcome variable for men compared to the association between diagnosis and outcome variable for women, as a ratio of odds ratios. However, the interpretation of interaction effects in logistic regressions can often be cumbersome and to facilitate interpretation, the odds ratios are calculated for each group of interest, allowing direct comparison. Statistical significance is determined through the interaction effect, which therefore also is presented. The results are also presented as the predicted outcome with and without diagnosis for the full sample, based on the regression models. The predicted probabilities gives an indication in absolute terms on the magnitude of the impact of CMD on labour market outcomes, how this differs over sex, age, education and country of birth, and how these differences impact on societal inequalities in employment, long term sick leave and disability pension. The full regression models, including models without interaction effects, are presented as Supplementary materials. Statistical significance is considered at the 5% level and all analyses are conducted in Stata 14. Ethical approval has been obtained from Lund Ethical Review Board (2015/204).

Results

The study population is described in Table 1. Cases and controls are matched using a propensity score based on sex, age, education and country of birth. Given the strict limit on the maximum distance between matched individuals, the distributions of these variables are identical. Some differences between cases and controls are due to the data material, i.e. individuals with a diagnosis of CMD are from Skåne; all controls are included in 2010. There are significant differences between cases and controls in terms of labour market outcomes the year before diagnosis/inclusion in the study (hereafter before diagnosis), where cases are worse off. Significant differences are also noted for all labour market outcomes during follow-up where those with a diagnosis of CMD to a higher extent are non-employed, on long term sick leave and on disability pension.

<< Table 1 >>

In Figures 2-4 we show trends in employment, sick leave and disability pension for all cases, one year before and up to three years after diagnosis. Separate trends are shown by sex (a), age (b), education (c) and country of birth (d). Employment rate declines during the first year after diagnosis for the group as a whole (reduction of 10 percentage points) and for all subgroups (Figure 2a-d). The youngest age group (20-29 years) has a substantially larger decline the first year compared to older age groups, but also a faster recovery. However, still three years after diagnosis the youngest and the oldest age groups are relatively worse off compared to the middle aged groups with reductions of 15 and 12 percentage points, respectively. The decline is also larger for those with mandatory and secondary education (around 11 percentage points) compared to higher educated (8 percentage points). Only very small differences over time are noted by sex and country of birth. Higher employment rates are noted for middle-aged, higher educated and individuals born in Sweden.

The trends in long term sick leave are similar between the different subgroups, all increasing within the range 9-15 percentage points in the year of diagnosis, then returning to slightly increased initial levels in the third year after diagnosis (Figure 3a-d). In the youngest age group the trend appear to be more persistent than in comparing subgroups, sick leave is still 4 percentage points higher in year three compared to the year before diagnosis. Lower levels of

sick leave are noted among men compared to women, among those aged 20-29 years compared to older, and among those with mandatory education compared to higher educated.

Rates of disability pension appear almost unaffected by a diagnosis of CMD (Figure 4a-d). In the third year, the results reveal a modest increase in the disability pension rate of 2 percentage points among the oldest and the youngest age groups. Differences in the levels of disability pension are noted where older, low educated and individuals born outside Sweden have higher proportions of disability pension.

<< Figures 2-4 >>

A diagnosis of CMD is associated with unfavourable labour market outcomes among both sexes (Table 2). Men and women are at increased risk of non-employment, long term sick leave and disability pension as shown by the estimated odds ratios, but the effects are larger among men. The interaction terms between *diagnosis* and *sex* indicate that there are statistically significant differences between men and women on risk of long term sick leave and risk of non-employment, but no significant differences between men and women on risk of disability pension. The last two rows in Table 2 show predicted probabilities of the different labour market outcomes based on the regression estimates. For women, the predicted probability of long term sick leave increases from 26 to 45 % with a diagnosis of CMD. The corresponding increase among men is 16 to 34 %. Although the absolute risk increase is the same for men and women, the relative increase is higher for men. The predicted probabilities gives an indication on the magnitude of the effect associated with a diagnosis of CMD. Non-employment and long term sick leave increases substantially (≥10 percentage points) while the increase in proportion on disability pension is relatively small (2 percentage point).

The associated effects of CMD on labour market outcomes stratified in age-groups are shown in Table 3. The youngest age-group (20-29 years) experience the largest associated effects of diagnosis with risk of non-employment and disability pension, and the older groups are significantly less likely to suffer from these consequences. In terms of long term sick leave, the strongest associated effect is found for 40-49-year-olds, however the results imply that there is little variation over age groups when it comes to consequences of CMD on long term sick leave. The youngest age-group fares worse both in absolute and relative terms with

regard to non-employment and disability pension. The predicted probabilities show that non-employment increases from 27 to 50 percent in the youngest group given diagnosis of CMD. Corresponding figures for the oldest age group are 25 to 39 percent.

A diagnosis of CMD is associated with unfavourable labour market outcomes among all education levels (Table 4). However, it appears as though the size of these associated effects increase with education. Individuals with higher education (more than 12 years of schooling) have significantly higher risks of non-employment, long term sick leave, and disability pension, compared to individuals with mandatory education (9 years of schooling). Those with secondary education (10-12 years of schooling) only have significantly higher risk of long term sick leave, compared to those with mandatory education. The highest educated group have lower predicted probabilities of non-employment and disability pension even after a diagnosis of CMD, but the differences in employment and disability pension between education levels are reduced in relative terms. The highest educated group have even higher probabilities of long term sick leave after a diagnosis of CMD, compared to those with mandatory education.

The associated effects of CMD on labour market outcomes stratified over country of birth differ between the different labour market outcomes (Table 5). A diagnosis of CMD is related to poorer labour market outcomes for those born in Sweden and for those born elsewhere. However, not being born in Sweden significantly increases the risk of non-employment and being on disability pension, and significantly reduces risk of long term sick leave, after a diagnosis of CMD. The predicted probabilities imply that individuals not born in Sweden fare relatively worse in terms of risk of non-employment and disability pension, while individuals born in Sweden fare worse in terms of long term sick leave, potentially increasing the differences in employment, long term sick leave and disability pension based on country of birth.

<< Tables 2-5 >>

Discussion

In this study, we investigate the association between CMD and subsequent labour market outcomes using a population sample on all individuals diagnosed with CMD in Region Skåne during 2009-2012. The results show that a diagnosis of CMD is associated with adverse labour market outcomes and these associations differ between population subgroups.

Both men and women who suffer from CMD are at increased risk of being non-employed, on long term sick leave and on disability pension. However, men appear to suffer worse consequences than women, except for disability pension where consequences are similar. Previous research have shown that consequences of mental disorders in sick leave are similar between men and women (Knudsen et al., 2013; Koopmans et al., 2010; Lexis et al., 2009), while mentally ill men more often are found in disability pension (Dorner et al., 2015; Lassemo et al., 2016; Wedegaertner et al., 2013) than mentally ill women. For consequences in employment both men and women have been found to be disadvantaged (J. Fletcher, 2013; Whooley et al., 2002b), but a recent Swedish study found that women with depressive symptoms were at higher risk of losing their job than men with depressive symptoms (Andreeva et al., 2015). Still, an overall assessment of the previous literature implies that men suffer worse consequences of CMD than women in several labour market outcomes, which is in line with the results of this study. It is suggested that men, at the same level of morbidity as women, have a lower tendency to report symptoms of mental ill health (Dorner et al., 2015). Consequently, mental disorders among men may reflect more severe symptomatology than among women at the time of diagnosis. This could explain the stronger association between CMD and adverse labour market outcomes found among men.

Our results show that the negative consequences of being diagnosed with CMD are present among all education levels, but a clear socioeconomic gradient is revealed. Surprisingly, we find that high educated individuals suffer worse labour market consequences than low educated. Individuals with high education experience significantly higher effects in all labour market outcomes compared to individuals with mandatory education, for individuals with secondary education this is true for long term sick leave. Our findings contradict earlier research which implies that there is an inverse socioeconomic gradient in the relationship between CMD and absence from work due to sickness or disability, such that those with low SES are disadvantaged (Ervasti et al., 2013; Virtanen et al., 2011), although disputed for mental health (Pikos, 2017). In this earlier research, it is suggested that the inverse socioeconomic gradient could be related to a larger prevalence of comorbidities with physical and mental disorders in low SES individuals, and that scarce resources to invest in treatment, poorer adherence to treatment, less social support and greater insecurities in employment among low SES individuals are other potential explanatory factors (Virtanen et al., 2011). There are potential explanations for our findings as well. It is possible that occupation type affects the relationship between CMD and labour market outcomes. High educated

individuals may have jobs related to more responsibilities and stress, which in combination with CMD could reinforce negative consequences on the labour market. High education has been shown to be positively associated with work-related mental health problems (Pikos, 2017). Moreover, it is possible that these inequalities are related to behavioural factors. Tendencies for health care seeking could, as between men and women, differ between socioeconomic groups. If individuals with high education seek help for mental problems to a lesser extent than those individuals with lower education at the same level of symptomatology, it could explain the higher effects among high educated individuals.

Consequences of CMD in labour market outcomes are substantial in all age groups, although the effects are not consistent across each of the outcomes. For instance, the youngest age group has significantly higher risks of non-employment and disability pension compared to older groups, but significantly lower risk of long term sick leave compared to 40-49 year olds. The risk of disability pension is significantly higher among the youngest compared to the other age groups, worth noting is that 20-29 year olds are covered by "activity compensation" instead of "sickness compensation" which is the case for age groups 30-39, 40-49 and 50-59 years. Although similar in many respects, activity compensation has a stronger focus on rehabilitation and also covers individuals who need longer time to complete mandatory and secondary schooling due to disability and/or sickness. Previous research on age differences in labour market consequences of CMD is scarce; in one study it was found that recurrence of sick leave due to a CMD decreased with age, but only among women (Koopmans et al., 2010). The negative effects of CMD in employment and disability pension appear to decrease with age, but intuitively perhaps the opposite would be expected, that the effect would increase with age due to a larger degree of physical comorbidities. It is possible that poorer labour market outcomes due to CMD are related to a weaker labour force attachment among the youngest age group compared to older individuals. It is also possible that younger individuals have more options to paid employment such as continued studies or direct parental support. More research is needed to disentangle these observed variations over age.

Our results show that individuals born in Sweden are at higher risk of long term sick leave, while those born elsewhere are at higher risk of non-employment and disability pension. Migration status has been found both positively (Dhadda & Greene, 2017) and negatively (Lindert et al., 2008) associated with mental health. It is possible that differences also in physical health, or differences in lifestyle choices, are related to the disadvantage in non-

employment and disability pension among individuals born outside Sweden. It is also possible that the perception of mental disorders and help-seeking behaviour differs based on migration status (Lindert et al., 2008), and that differences in the attachment to the labour force are related to these variations.

As mentioned earlier, differences in the consequences of CMD across sex, age, SES and country of birth could impact on societal inequalities in labour market outcomes, both through actual differences in the effects but also through further social stratification from disadvantageous consequences in health. For example, the predicted probability of being non-employed is higher for those born outside Sweden, and the consequences of CMD in non-employment is higher in this group. As a result, the gap in employment increases between individuals born inside/outside Sweden. This is expected to be related to increased income inequality and potentially increased health inequality given a negative correlation between unemployment and health. Differences in the consequences of CMD over population subgroups could also reduce already existing societal inequalities. For example, the predicted probability of being on long term sick leave is higher among women compared to men in the general population, while the effect of CMD on long term sick leave is significantly higher among men. Consequently, differences in the consequences of CMD decrease inequality between men and women in long term sick leave, at least in relative terms. Similarly, the predicted probability of being non-employed is higher among lower educated compared to high educated individuals, while the effect of being diagnosed with a CMD is significantly higher among high educated individuals. As a result, education-level differences in the effects of CMD reduce the relative inequalities in non-employment between low and high educated individuals. Worth noting is that individuals with high education have an advantage over low educated in terms of employment even after a diagnosis of CMD.

Not all differences/inequalities can be termed as inequities. A key distinction is that inequality is a dimensional description which simply reflects an unequal distribution, while inequity reflects an inequality which is also judged as unfair or unjust. By common definition, an inequality which is preventable or unnecessary should also be seen as inequitable, since allowing it to persist is unjust (Arcaya et al., 2015). Distinguishing between inequalities and inequities also depends on the determinants of the variation. Health variations which are determined by natural, biological factors or factors related to free choice, are generally not considered as inequities (Whitehead, 1992). Aside from biological differences between different population subgroups, fundamental social structures affect the

way different population subgroups are treated, as well as the way they behave (Marmot et al.). Hence, inequalities arise between different population subgroups in many aspects. Our results imply that significant inequalities exist between population subgroups in the consequences of CMD, but it is unclear if these differences are inequitable. For example, inequalities between age groups are often caused by some natural variation and if so, generally considered as fair. We find that the impact of CMD on non-employment is higher among the young. If the larger effect among the young is related to less years of work experience or other options to paid employment, it could pass as a naturally caused variation. However, if this inequality is caused by differences in the employment conditions between young and old individuals, such that young individuals more often are found in precarious employment conditions, then this inequality could be abolished by proper interventions. Whether the inequalities in labour market consequences of CMDs identified in this study should be considered as inequities needs to be considered in a societal context.

An unequal distribution of the consequences of CMD, in combination with an uneven disease onset and the complexity of different underlying causes between different population subgroups highlights the need of a system approach in future studies where the contribution of each step to societal inequalities is quantified. According to (Diderichsen et al., 2012), health inequalities can be intervened in four potential policy entry channels (see Figure 1 arrow A-D), by acting on social stratification (A), by reducing the exposure and vulnerability (B,C) to ill health among the disadvantaged, and by levelling the consequences of ill health among different population subgroups (D). Our results show that it can be motivated to focus inventions on particular groups if the policy purpose is both to reduce poor mental health and to reduce societal inequalities. In order to mitigate the consequences of CMD among those worse off, it is crucial to know the current distribution of these consequences between different population subgroups. Furthermore, it can be useful to consider the results of this study when developing new public policies and interventions, in order to assess how a particular policy or intervention might impact on existing societal inequalities. However, it should be noted that the effect of policies and interventions most likely also differ over population subgroups.

Strengths and weaknesses

A strength of the current study is that it covers *all* individuals with a diagnosis of CMD in one region in Sweden (Region Skåne), although the control group is drawn from a national

representative sample. The cases consist of two groups; one that received standard care and one covered by a new policy and received cognitive behaviour therapy. The latter group, compared to the former, was more advantaged in terms of education, income and employment (Jarl et al., 2017). At the same time, cognitive behaviour therapy was more effective in reducing health care costs and improve labour market outcomes compared to standard treatment (Jarl et al., 2017). Due to better access to a more effective treatment, individuals with for example higher education would then manifest better outcomes. This potential bias is mitigated by the matching approach, although it is possible that the results are less generalizable to the general (less educated) population.

All regressions include the outcome variable the year before diagnosis since this has shown to be a strong predictor of labour market outcomes. However, interpretation of the estimated coefficient can be difficult since it is likely to capture different aspects, such as attachment to the labour market, "willingness" to work, and overall health status. Disentangling these effects is left to future research.

Conclusion

Common mental disorders have different negative effects on labour market outcomes based on sex, age, education, and country of birth. Inequalities in the consequences of common mental disorders sometimes contributes to, and sometimes mitigates, societal inequalities in employment, long term sick leave and disability pension. When developing new strategies to tackle mental ill health in the population, it may therefore be motivated to consider not only inequalities in the prevalence of mental disorders, but also inequalities in the consequences of these disorders.

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Tables and figures

Table 1 Descriptive statistics of study population

	Case (n=38,473)	Controls (n=38,473)	Total (n=76,946)
Sex			
Female	63	63	63
Male	37	37	37
Age			
20-29	17	17	17
30-39	27	27	27
40-49	30	30	30
50-59	26	26	26
Education			
Mandatory	14	14	14
Secondary	49	49	49
Higher	37	37	37
Born outside Sweden	18	18	18
Resident of Skåne ***	100	13	56
Year of inclusion in the study ***			
2009	24	0	12
2010	39	100	69
2011	37	0	18
2012	0	0	0
Employed the year before diagnosis***	79	82	81
On long-term sick leave the year before diagnosis ***	**18**	**9**	**14**
Days on long-term sick leave the year before diagnosis ***	20.28 (0.34)	5.93 (0.17)	13.10 (0.19)
Disability pension the year before diagnosis ***	**13**	**7**	**10**
Disposable income the year before diagnosis ***			
Income quintile 1	**26**	**22**	**24**
Income quintile 2	23	21	22
Income quintile 3	**20**	**20**	**20**
Income quintile 4	17	20	18
Income quintile 5	**13**	**18**	**15**
Non-employed during at least one year during follow-up (%) ***	**40**	**21**	**31**
On long-term sick leave during follow-up (%) ***	43	20	32
Disability pension during follow-up (%) ***	**15**	**7**	**11**

Note: For continuous variables are standard errors presented in parenthesis. Statistically significant differences are noted on *** 1% level.

Table 2 The effect associated with diagnosis in CMD on labour market outcomes over sex and the predicted probabilities of specific labour market outcomes over diagnosis and sex, based on logistic regressions.

	Non-employed during at least one of the three follow-up years		On long term sick leave during follow-up		Disability pension at any time during follow-up	
Odds ratios of diagnosis among women[1]	4.03*** [3.45 - 4.71]		1.82** [1.59 - 2.09]		5.57*** [3.43 - 9.05]	
Odds ratios of diagnosis among men[1]	5.36*** [4.58 - 6.26]		2.18** [1.90 - 2.51]		6.61*** [4.10 - 10.64]	
Diagnosis * Sex	1.33*** [1.21 - 1.46]		1.20*** [1.11 - 1.29]		1.19 [0.92 - 1.53]	
	Without diagnosis	**With diagnosis**	**Without diagnosis**	**With diagnosis**	**Without diagnosis**	**With diagnosis**
Predicted probability women[2]	0.23 [0.22 - 0.23]	0.37 [0.36 - 0.37]	0.26 [0.25 - 0.26]	0.45 [0.44 - 0.46]	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.12]
Predicted probability men[2]	0.23 [0.22 - 0.23]	0.40 [0.40 - 0.41]	0.16 [0.15 - 0.16]	0.34 [0.33 - 0.35]	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.13]

Note: The following variables are controlled for in the regression: diagnosis, sex, education, age, country of birth, disposable income, and the outcome variable the year before diagnosis. See Supplementary material for the full regression results. Statistical significance is noted on ** 5 % and *** 1 % level. [1] Odds ratios are calculated at the reference level for other variables, i.e. 20-29 years of age, mandatory education, and born in Sweden. [2] Predicted probabilities of outcomes are calculated as observed for other variables.

Table 3 The effect associated with diagnosis in CMD on labour market outcomes over age-groups and the predicted probabilities of specific labour market outcomes over diagnosis and age-groups, based on logistic regressions.

	Non-employed during at least one of the three follow-up years		On long term sick leave during follow-up		Disability pension at any time during follow-up	
Odds ratios of diagnosis among 20-29 yrs[1]	4.03*** [3.45 - 4.71]		1.82*** [1.59 - 2.09]		5.57*** [3.43 - 9.05]	
Odds ratios of diagnosis among 30-39 yrs[1]	3.22*** [2.77 - 3.75]		1.93*** [1.71 - 2.17]		1.57** [1.04 - 2.38]	
Odds ratios of diagnosis among 40-49 yrs[1]	3.01*** [2.60 - 3.48]		2.08*** [1.85 - 2.34]		1.98*** [1.38 - 2.82]	
Odds ratios of diagnosis among 50-59 yrs[1]	2.68*** [2.33 - 3.09]		1.82*** [1.62 - 2.04]		2.00*** [1.43 - 2.79]	
Diagnosis * Age 30-39 years	0.80*** [0.70 - 0.91]		1.06 [0.94 - 1.18]		0.28*** [0.17 - 0.47]	
Diagnosis * Age 40-49 years	0.75*** [0.66 - 0.85]		1.14** [1.02 - 1.28]		0.35*** [0.22 - 0.56]	
Diagnosis * Age 50-59 years	0.66*** [0.59 - 0.75]		1.00 [0.89 - 1.12]		0.36*** [0.23 - 0.56]	
	Without diagnosis	**With diagnosis**	**Without diagnosis**	**With diagnosis**	**Without diagnosis**	**With diagnosis**
Predicted probability 20-29 yrs[2]	0.27 [0.26 - 0.28]	0.50 [0.49 - 0.51]	0.17 [0.16 - 0.18]	0.32 [0.31 - 0.33]	0.08 [0.08 - 0.09]	0.12 [0.11 - 0.12]
Predicted probability 30-39 yrs[2]	0.21 [0.20 - 0.21]	0.35 [0.34 - 0.36]	0.24 [0.23 - 0.24]	0.43 [0.42 - 0.44]	0.09 [0.09 - 0.10]	0.10 [0.10 - 0.11]
Predicted probability 40-49 yrs[2]	0.20 [0.20 - 0.21]	0.33 [0.33 - 0.34]	0.23 [0.22 - 0.23]	0.44 [0.43 - 0.44]	0.10 [0.10 - 0.10]	0.12 [0.11 - 0.12]
Predicted probability 50-59 yrs[2]	0.25 [0.24 - 0.25]	0.39 [0.38 - 0.40]	0.23 [0.23 - 0.24]	0.42 [0.41 - 0.43]	0.11 [0.11 - 0.12]	0.14 [0.14 - 0.15]

Note: See Table 2

Table 4 The effect associated with diagnosis in CMD on labour market outcomes over education and the predicted probabilities of specific labour market outcomes over diagnosis and education, based on logistic regressions.

	Non-employed during at least one of the three follow-up years		On long term sick leave during follow-up		Disability pension at any time during follow-up	
Odds ratios of diagnosis among mandatory education[1]	4.03*** [3.45 - 4.71]		1.82*** [1.59 - 2.09]		5.57*** [3.43 - 9.05]	
Odds ratios of diagnosis among secondary education[1]	3.93*** [3.51 - 4.39]		2.50*** [2.25 - 2.77]		7.28*** [4.64 - 11.40]	
Odds ratios of diagnosis among higher education[1]	4.85*** [4.28 - 5.49]		3.12*** [2.80 - 3.49]		8.84*** [5.42 - 14.43]	
Diagnosis * Secondary education	0.97 [0.86 - 1.11]		1.37*** [1.23 - 1.53]		1.31 [0.96 - 1.77]	
Diagnosis * Higher education	1.20*** [1.05 - 1.38]		1.72*** [1.53 - 1.92]		1.59** [1.11 - 2.26]	
	Without diagnosis	**With diagnosis**	**Without diagnosis**	**With diagnosis**	**Without diagnosis**	**With diagnosis**
Predicted probability mandatory education[2]	0.27 [0.26 - 0.28]	0.45 [0.44 - 0.46]	0.24 [0.22 - 0.25]	0.36 [0.34 - 0.37]	0.11 [0.10 - 0.11]	0.12 [0.12 - 0.13]
Predicted probability secondary education[2]	0.24 [0.23 - 0.24]	0.39 [0.38 - 0.39]	0.24 [0.24 - 0.25]	0.43 [0.43 - 0.44]	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.12]
Predicted probability higher education[2]	0.19 [0.19 - 0.20]	0.35 [0.34 - 0.35]	0.19 [0.18 - 0.19]	0.40 [0.39 - 0.41]	0.10 [0.09 - 0.10]	0.11 [0.11 - 0.12]

Note: See Table 2

Table 5 The effect associated with diagnosis in CMD on labour market outcomes over country of birth and the predicted probabilities of specific labour market outcomes over diagnosis and country of birth, based on logistic regressions.

	Non-employed during at least one of the three follow-up years		On long term sick leave during follow-up		Disability pension at any time during follow-up	
Odds ratios of diagnosis among individuals born in Sweden[1]	4.03*** [3.45 - 4.71]		1.82*** [1.59 - 2.09]		5.57*** [3.43 - 9.05]	
Odds ratios of diagnosis among individuals born outside Sweden[1]	4.57*** [3.81 - 5.47]		1.39*** [1.19 - 1.62]		7.97*** [4.64 - 13.68]	
Diagnosis * Born outside Sweden	1.13** [1.02 - 1.26]		0.76*** [0.70 - 0.84]		1.43** [1.07 - 1.91]	
	Without diagnosis	**With diagnosis**	**Without diagnosis**	**With diagnosis**	**Without diagnosis**	**With diagnosis**
Predicted probability individuals born in Sweden[2]	0.22 [0.22 - 0.22]	0.36 [0.36 - 0.37]	0.22 [0.21 - 0.22]	0.42 [0.41 - 0.43]	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.12]
Predicted probability individuals born outside Sweden[2]	0.26 [0.25 - 0.27]	0.45 [0.44 - 0.46]	0.23 [0.22 - 0.24]	0.37 [0.36 - 0.38]	0.10 [0.10 - 0.10]	0.13 [0.12 - 0.13]

Note: See Table 2

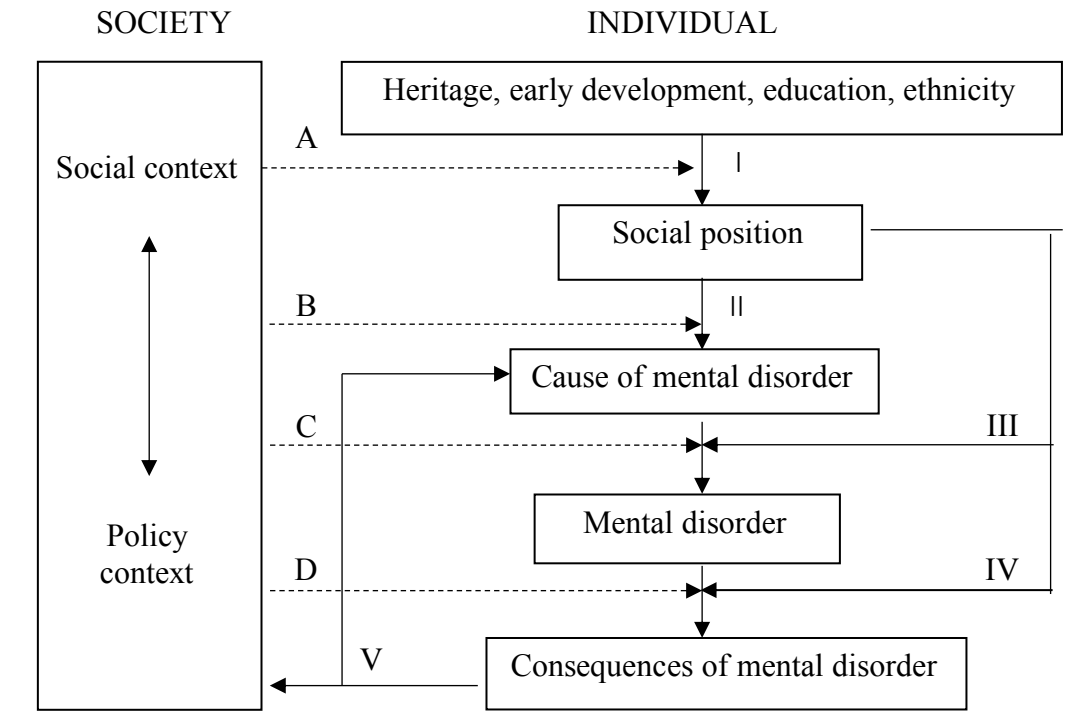
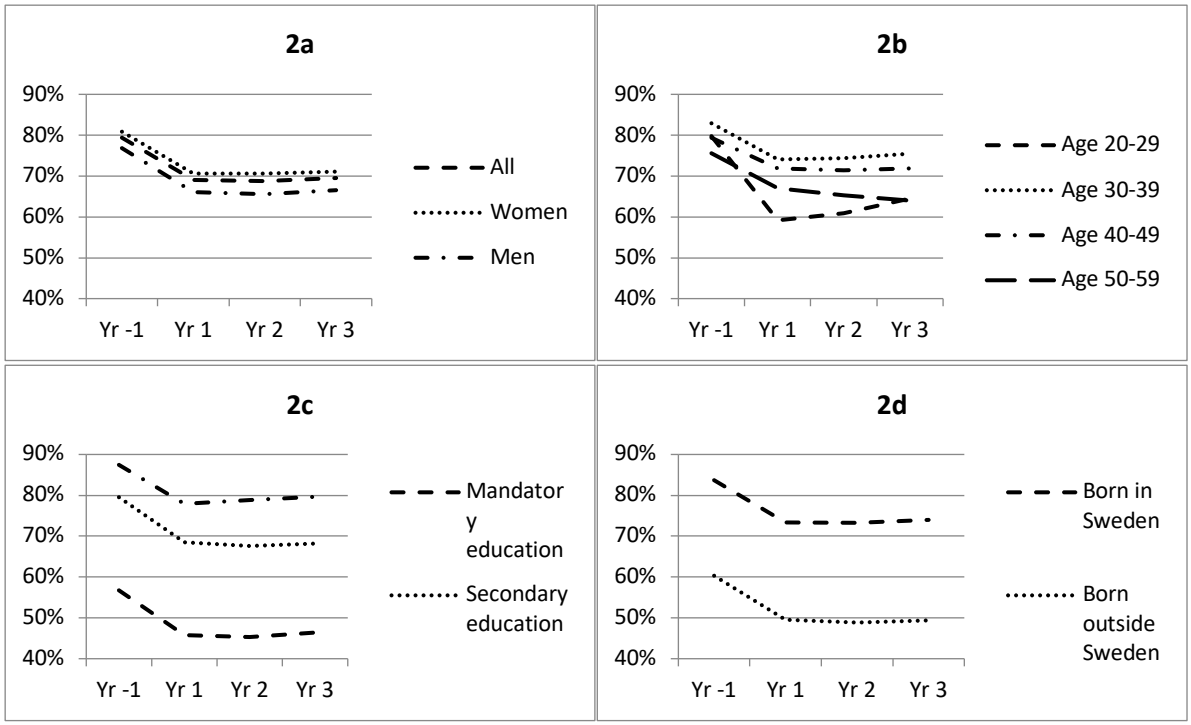
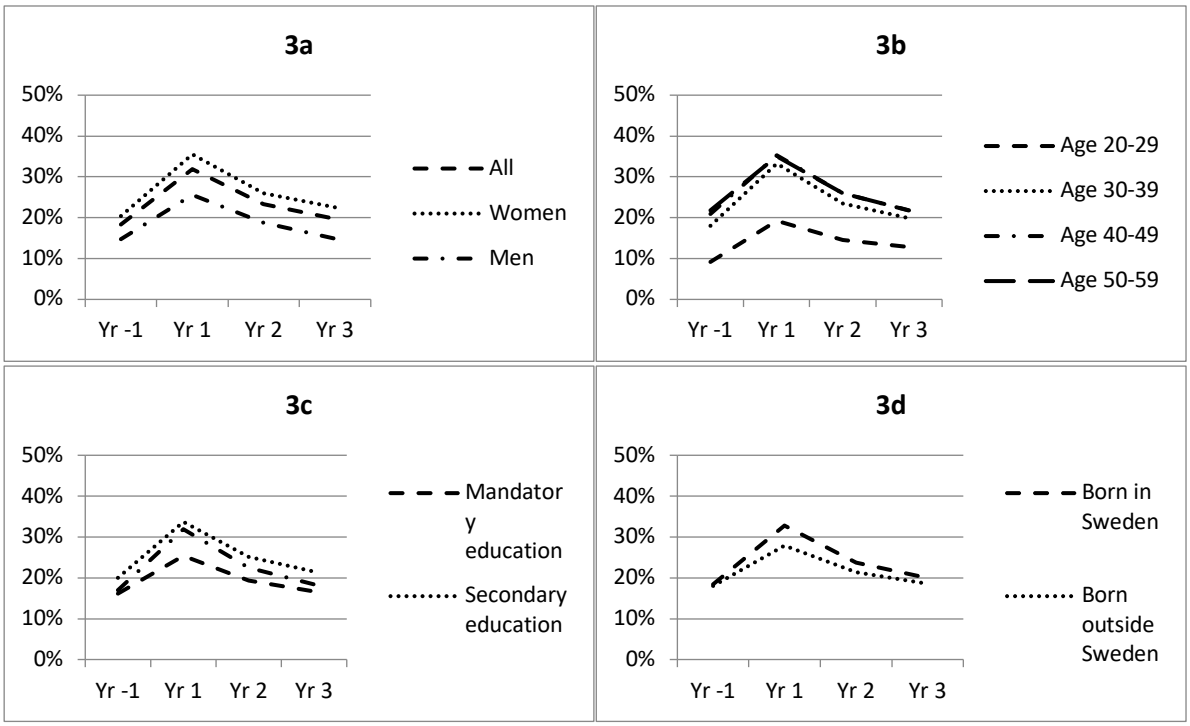


Figure 1 Model on determinants of health inequalities. Source: Adapted from Diderichsen et al. 2012



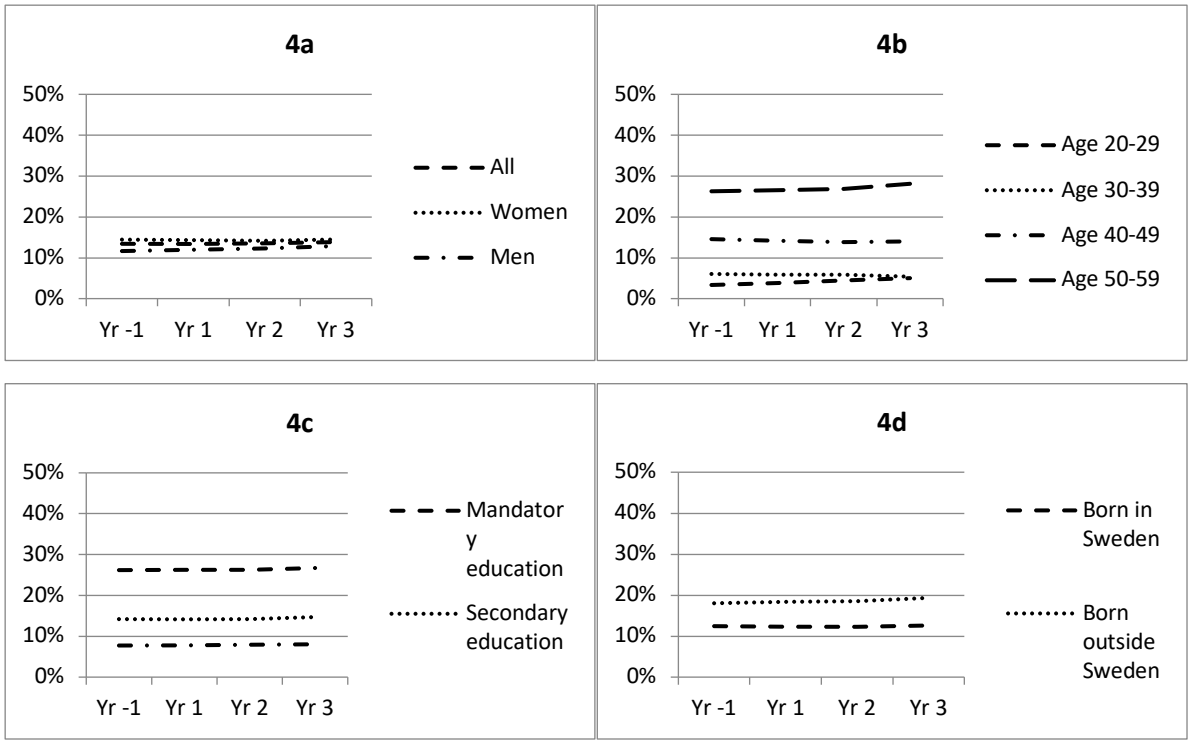
Note: Yr -1, 1, 2, and 3 corresponds to the year before diagnosis of CMD and the first, second and third year following diagnosis.

Figure 2: Employment rate before and after diagnosed with CMD



Note: See Figure 2.

Figure 3: Long term sick leave rate before and after diagnosed with CMD



Note: See Figure 2.

Figure 4: Proportion on disability pension before and after diagnosed with CMD

Supplementary material

Data material

In this study, we employ a dataset containing all individuals who received a diagnosis of CMD in outpatient care in Region Skåne, Sweden during the period 2009-2012. The dataset was originally collected to evaluate the Swedish national rehabilitation guarantee "Rehabiliteringsgarantin" which was implemented with an aim to reduce sickness absenteeism and thus societal costs due to CMD (Hägglund et al., 2012; Jarl et al., 2017). CMDs are defined to include the following diagnoses (ICD-10 code): depressive episode (F32), recurrent depressive episode (F33), phobic anxiety disorders (F40), panic disorders (F410), generalised anxiety disorder (F411), unspecified anxiety disorder (F419), obsessive-compulsive disorder (F42), post-traumatic stress disorder (F431), other reactions to severe stress (F438), unspecified reaction to severe stress (F439). Individuals with a diagnosis of CMD who are covered by the rehabilitation guarantee are included in the dataset. Included are also those not covered by the rehabilitation guarantee, but who had a second visit within two months for the same diagnosis. Individuals with psychiatric inpatient episodes are excluded. These restrictions were set in order to exclude individuals who did not need any treatment (very mild) and those too severe to be considered CMD (Jarl et al., 2017). The resulting dataset, which comprises of 67 167 individuals (19 657 in the rehabilitation guarantee and 47 510 in standard care), is used in this study. The sample is limited to individuals aged 20-59 years at the time of diagnosis to make sure that the included individuals does not reach retirement age during the follow-up years.

A sample of potential control individuals was constructed using the Swedish national survey of living conditions (ULF-survey by Swedish acronym) from Statistics Sweden which is integrated with the EU-SILC (European Statistics on Income and Living Conditions). A representative sample of around 20 000 individuals (aged 16 and above) are approached each year with a response rate of around 67% (Statistiska Centralbyrån, 2011). We exclude all individuals with a diagnosis of CMD during 2009-2012 according to the inpatient- and outpatient registers from the National Board of Health and Welfare from the sample of potential controls. Since primary care is not included in the outpatient register, we cannot exclude individuals with CMD following the same definition as used for the cases. The potential controls should therefore be seen as a sample representative of the general population, rather than representative of the healthy population, although the most severe

cases have been excluded. The potential control individuals were matched to the cases on a 1:1 rate using propensity score matching. A nearest neighbour matching approach without replacement and a maximum caliper (distance in terms of propensity score) of 0.001 was applied. The propensity score was based on sex, age, education and country of birth. Unmatched individuals were dropped from the analysis, leaving a final sample of 76,946 individuals. For the defined cases of CMD, the consequences of diagnosis were studied from the date of diagnosis. For the control group, however, this was not possible as they per definition do not have a diagnosis and therefore no starting point for the analyses. We therefore set the year 2010 as the first year of analysis which corresponds to the year with the highest proportion of diagnosis among the cases.

Results

Table A1 Logistic regression (odds ratios) of factors associated with employment probability

	Non-employed during at least one of the three follow-up years Model 1	**Non-employed during at least one of the three follow-up years Model 2**
Main effects		
Constant	17.67*** [15.78 - 19.78]	17.24*** [14.97 - 19.85]
No diagnosis	Ref.	Ref.
Diagnosis	3.75*** [3.54 - 3.96]	4.03*** [3.45 - 4.71]
Woman	Ref.	Ref.
Man	1.16*** [1.11 - 1.22]	0.97 [0.90 - 1.05]
Mandatory education	Ref.	Ref.
Secondary education	0.68*** [0.64 - 0.73]	0.69*** [0.63 - 0.77]
Higher education	0.48*** [0.45 - 0.52]	0.43*** [0.39 - 0.48]
Age 20-29 years	Ref.	Ref.
Age 30-39 years	0.44*** [0.41 - 0.47]	0.51*** [0.46 - 0.56]
Age 40-49 years	0.40*** [0.37 - 0.42]	0.48*** [0.43 - 0.53]
Age 50-59 years	0.61*** [0.57 - 0.65]	0.78*** [0.71 - 0.87]
Born in Sweden	Ref.	Ref.
Born outside Sweden	1.65*** [1.56 - 1.74]	1.53*** [1.41 - 1.66]
Employed the year before diagnosis	0.03*** [0.03 - 0.03]	0.03*** [0.03 - 0.03]

Disposable income the year before diagnosis, income quintile 1	Ref.	Ref.
Disposable income the year before diagnosis, income quintile 2	0.77*** [0.73 - 0.82]	0.78*** [0.73 - 0.82]
Disposable income the year before diagnosis, income quintile 3	0.58*** [0.54 -0.61]	0.58*** [0.54 - 0.61]
Disposable income the year before diagnosis, income quintile 4	0.36*** [0.33 - 0.38]	0.36*** [0.33 - 0.38]
Disposable income the year before diagnosis, income quintile 5	0.29*** [0.27 - 0.31]	0.29*** [0.27 - 0.32]
Interaction effects		
Diagnosis * Man		1.33*** [1.21 - 1.46]
Diagnosis * Secondary education		0.97 [0.86 - 1.11]
Diagnosis * Higher education		1.20*** [1.05 - 1.38]
Diagnosis * Age 30-39 years		0.80*** [0.70 - 0.91]
Diagnosis * Age 40-49 years		0.75*** [0.66 - 0.85]
Diagnosis * Age 50-59 years		0.66*** [0.59 - 0.75]
Diagnosis * Born outside Sweden		1.13** [1.02 - 1.26]
n	76,944	76,944
Pseudo-R^2	0.39	0.39

Note: All regressions also control for year of diagnosis/inclusion in study. Statistical significance is noted on * 10 %, ** 5 % and *** 1 % level.

Table A2 Predicted probability of non-employed (Model 2 in Table A1) during at least one of the three follow-up years

	Without diagnosis	**With diagnosis**
Women	0.23 [0.22 - 0.23]	0.37 [0.36 - 0.37]
Men	0.23 [0.22 - 0.23]	0.40 [0.40 - 0.41]
Mandatory education	0.27 [0.26 - 0.28]	0.45 [0.44 - 0.46]
Secondary education	0.24 [0.23 - 0.24]	0.39 [0.38 - 0.39]
Higher education	0.19 [0.19 - 0.20]	0.35 [0.34 - 0.35]
Age 20-29 years	0.27 [0.26 - 0.28]	0.50 [0.49 - 0.51]

Age 30-39 years	0.21 [0.20 - 0.21]	0.35 [0.34 - 0.36]
Age 40-49 years	0.20 [0.20 - 0.21]	0.33 [0.33 - 0.34]
Age 50-59 years	0.25 [0.24 - 0.25]	0.39 [0.38 - 0.40]
Born in Sweden	0.22 [0.22 - 0.22]	0.36 [0.36 - 0.37]
Born outside Sweden	0.26 [0.25 - 0.27]	0.45 [0.44 - 0.46]

Table A3 Logistic regression of factors associated with the probability of long term sick leave up to three years after diagnosis in CMD

	On long term sick leave during follow-up - Model 1	**On long term sick leave during follow-up - Model 2**
Main effects		
Constant	0.11*** [0.10 - 0.12]	0.15*** [0.13 - 0.17]
No diagnosis	Ref.	Ref.
Diagnosis	2.77*** [2.65 - 2.90]	1.82*** [1.59 - 2.09]
Women	Ref.	Ref.
Men	0.55*** [0.53 - 0.57]	0.49*** [0.47 - 0.52]
Mandatory education	Ref.	Ref.
Secondary education	1.27*** [1.21 - 1.34]	1.05 [0.97 - 1.14]
Higher education	1.00 [0.95 - 1.06]	0.72*** [0.67 - 0.79]
Age 20-29 years	Ref.	Ref.
Age 30-39 years	1.71*** [1.62 - 1.80]	1.65*** [1.51 - 1.80]
Age 40-49 years	1.67*** [1.58 - 1.76]	1.54*** [1.41 - 1.68]
Age 50-59 years	1.63*** [1.54 - 1.72]	1.62*** [1.48 - 1.77]
Born in Sweden	Ref.	Ref.
Born outside Sweden	0.89*** [0.86 - 0.94]	1.05 [0.98 - 1.12]
On long term sick leave the year before diagnosis	5.64*** [5.38 - 5.91]	5.61*** [5.35 - 5.89]
Disposable income the year before diagnosis, income quintile 1	Ref.	Ref.
Disposable income the year before diagnosis, income quintile 2	1.21*** [1.15 - 1.27]	1.21*** [1.15 - 1.27]
Disposable income the year before diagnosis, income quintile 3	1.58*** [1.50 - 1.66]	1.57*** [1.49 - 1.66]

Disposable income the year before diagnosis, income quintile 4	1.68*** [1.60 - 1.78]	1.68*** [1.59 - 1.77]
Disposable income the year before diagnosis, income quintile 5	1.44*** [1.35 - 1.53]	1.45*** [1.36 - 1.53]
Interaction effects		
Diagnosis * Man		1.20*** [1.11 - 1.29]
Diagnosis * Secondary education		1.37*** [1.23 - 1.53]
Diagnosis * Higher education		1.72*** [1.53 - 1.92]
Diagnosis * Age 30-39 years		1.06 [0.94 - 1.18]
Diagnosis * Age 40-49 years		1.14** [1.02 - 1.28]
Diagnosis * Age 50-59 years		1.00 [0.89 - 1.12]
Diagnosis * Born outside Sweden		0.76*** [0.70 - 0.84]
n	76,944	76,944
Pseudo-R^2	0.14	0.14

Note: All regressions also control for year of diagnosis/inclusion in study. Statistical significance is noted on * 10 %, ** 5 % and *** 1 % level.

Table A4 Predicted probability of long term sick leave (Model 2 in Table A3) over three years follow-up

	Without diagnosis	**With diagnosis**
Women	0.26 [0.25 - 0.26]	0.45 [0.44 - 0.46]
Men	0.16 [0.15 - 0.16]	0.34 [0.33 - 0.35]
Mandatory education	0.24 [0.22 - 0.25]	0.36 [0.34 - 0.37]
Secondary education	0.24 [0.24 - 0.25]	0.43 [0.43 - 0.44]
Higher education	0.19 [0.18 - 0.19]	0.40 [0.39 - 0.41]
Age 20-29 years	0.17 [0.16 - 0.18]	0.32 [0.31 - 0.33]
Age 30-39 years	0.24 [0.23 - 0.24]	0.43 [0.42 - 0.44]
Age 40-49 years	0.23 [0.22 - 0.23]	0.44 [0.43 - 0.44]
Age 50-59 years	0.23 [0.23 - 0.24]	0.42 [0.41 - 0.43]
Born in Sweden	0.22	0.42

	[0.21 - 0.22]	[0.41 - 0.43]
Born outside Sweden	0.23 [0.22 - 0.24]	0.37 [0.36 - 0.38]

Table A5 Logistic regression (odds ratios) of factors associated with disability pension

	Model 1 – disability pension at any time during follow-up	**Model 2 – disability pension at any time during follow-up**
Main effects		
Constant	0.02*** [0.02 - 0.03]	0.01*** [0.01 - 0.02]
No diagnosis	Ref.	Ref.
Diagnosis	3.16*** [2.70 - 3.70]	5.57*** [3.43 - 9.05]
Women	Ref.	Ref.
Men	1.24*** [1.10 - 1.39]	1.10 [0.88 - 1.37]
Mandatory education	Ref.	Ref.
Secondary education	0.83** [0.72 - 0.96]	0.69*** [0.54 - 0.89]
Higher education	0.57*** [0.49 - 0.67]	0.41*** [0.30 - 0.55]
Age 20-29 years	Ref.	Ref.
Age 30-39 years	0.66*** [0.54 - 0.80]	1.78** [1.13 - 2.79]
Age 40-49 years	1.22** [1.02 - 1.46]	2.82*** [1.86 - 4.26]
Age 50-59 years	3.22*** [2.70 - 3.84]	7.39*** [4.92 - 11.10]
Disability pension the year before diagnosis	1590.46*** [1369.33 - 1847.30]	1576.76*** [1358.48 - 1830.10]
Born in Sweden	Ref.	Ref.
Born outside Sweden	1.29*** [1.13 - 1.47]	1.00 [0.78 - 1.28]
Disposable income the year before diagnosis, income quintile 1	Ref.	Ref.
Disposable income the year before diagnosis, income quintile 2	0.94 [0.81 - 1.09]	0.95 [0.82 - 1.10]
Disposable income the year before diagnosis, income quintile 3	0.74*** [0.63 - 0.87]	0.75*** [0.64 - 0.88]
Disposable income the year before diagnosis, income quintile 4	0.52*** [0.43 - 0.62]	0.52*** [0.43 - 0.63]
Disposable income the year before diagnosis, income quintile 5	0.38*** [0.31 - 0.48]	0.39*** [0.31 - 0.48]
Interaction effects		

Diagnosis * Man		1.19 [0.92 - 1.53]
Diagnosis * Secondary education		1.31* [0.96 - 1.77]
Diagnosis * Higher education		1.59** [1.11 - 2.26]
Diagnosis * Age 30-39 years		0.28*** [0.17 - 0.47]
Diagnosis * Age 40-49 years		0.35*** [0.22 - 0.56]
Diagnosis * Age 50-59 years		0.36*** [0.23 - 0.56]
Diagnosis * Born outside Sweden		1.43** [1.07 - 1.91]
n		76,945
Pseudo-R^2		0.77

Note: All regressions also control for year of diagnosis/inclusion in study. Statistical significance is noted on * 10 %, ** 5 % and *** 1 % level.

Table A6 Predicted probability of disability pension (Model 2 in Table A5) at any time during the three years of follow-up

	Without diagnosis	**With diagnosis**
Women	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.12]
Men	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.13]
Mandatory education	0.11 [0.10 - 0.11]	0.12 [0.12 - 0.13]
Secondary education	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.12]
Higher education	0.10 [0.09 - 0.10]	0.11 [0.11 - 0.12]
Age 20-29 years	0.08 [0.08 - 0.09]	0.12 [0.11 - 0.12]
Age 30-39 years	0.09 [0.09 - 0.10]	0.10 [0.10 - 0.11]
Age 40-49 years	0.10 [0.10 - 0.10]	0.12 [0.11 - 0.12]
Age 50-59 years	0.11 [0.11 - 0.12]	0.14 [0.14 - 0.15]
Born in Sweden	0.10 [0.10 - 0.10]	0.12 [0.12 - 0.12]
Born outside Sweden	0.10 [0.10 - 0.10]	0.13 [0.12 - 0.13]