

**Title: Paid employment and common mental disorders in 50-64 year olds: analysis of three cross sectional nationally representative survey samples in 1993, 2000 and 2007**

**short title for running head:** Employment and mental health among 50- 64 year olds

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**word count of text:** 3,759 (excluding abstract, tables/figures and reference list)

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## **Required Statements**

### **Acknowledgements**

None

### **Financial Support**

GP, GDG, LMC and KG were funded by the British cross-research council Lifelong Health and Wellbeing (LLHW) programme under Extending Working Lives as part of an interdisciplinary consortium on Wellbeing, Health, Retirement and the Lifecourse (WHERL) (ES/L002825/1). RS and GP additionally received funding from the National Institute for Health Research (NIHR) Biomedical Research Centre at South London and Maudsley NHS Foundation Trust and King's College London.

### **Conflict of Interest**

None

### **Ethical Standards**

There are no ethical conflicts regarding this research. We used free public anonymised databases from UK Data Service (<https://www.ukdataservice.ac.uk>).

### **Availability of Data and Materials**

Data used for this research are available publicly in an anonymised format from UK Data Service website (<https://www.ukdataservice.ac.uk>).

## **Paid employment and common mental disorders in 50-64 year olds: analysis of three cross sectional nationally representative survey samples in 1993, 2000 and 2007**

### **ABSTRACT**

**Aims:** Associations between employment status and mental health are well-recognised, but evidence is sparse on the relationship between paid employment and mental health in the years running up to statutory retirement ages using robust mental health measures. In addition, there has been no investigation into the stability over time in this relationship: an important consideration if survey findings are used to inform future policy. Aim of this study is to investigate the association between employment status and common mental disorder (CMD) in 50-64 year old residents in England and its stability over time, taking advantage of three national mental health surveys carried out over a 14 year period.

**Methods:** Data were analysed from the British National Surveys of Psychiatric Morbidity of 1993, 2000 and 2007. Paid employment status was the primary exposure of interest and common mental disorder (CMD) the primary outcome – both ascertained identically in all three surveys (CMD from the revised Clinical Interview Schedule). Multivariable logistic regression models were used.

**Results:** The prevalence of CMD was higher in people not in paid employment across all survey years; however, this association was only present for non-employment related to poor health as an outcome and was not apparent in those citing other reasons for non-employment. Odds ratios for the association between non-employment due to ill health and CMD were 3.05 in 1993, 3.56 in 2000, and 2.80 in 2007, after adjustment for age, gender, marital status, education, social class, housing tenure, financial difficulties, smoking status, recent physical health consultation and activities of daily living impairment.

**Conclusions:** The prevalence of CMD was higher in people not in paid employment for health reasons but was not associated with non-employment for other reasons. Associations had been relatively stable in strength from 1993 to 2007 in those three cross sectional nationally representative samples.

## INTRODUCTION

The UK has witnessed significant increases in the percentage of older workers in the labour market, and the employment rate for those aged 50 and over is currently 57% (ONS Labour Force survey, 2016) compared to 31% around a decade ago (Whiting, 2005), reflecting policies to encourage older workers to remain active in the labour market and delay retirement (Vickerstaff, 2010; Bartley, 1994). Investigations of employment status and mental health have primarily focused on unemployment as an exposure and its negative impact on psychological wellbeing. Studies of retirement and mental health have yielded mixed results. On the one hand, reduced prevalence of depressive episodes and mental fatigue have been reported following retirement (Calvo et al., 2013; Westerlund et al., 2010; Choi et al., 2013). However, this appears to coincide with the statutory retirement age and not the timing of individual exit from work (Villamil et al., 2006). British data indicate worse mental health associated with early retirement (Buxton et al., 2005), an association which diminishes closer to statutory retirement ages (Butterworth et al., 2006; Melzer et al., 2004). Older workers may leave the workforce due to disability, unemployment, or early retirement, although these distinctions are often blurred (Calvo, 2006): for example, influenced by availability of disability and/or retirement benefits (Laaksonen et al., 2016; ONS Labour Force survey, 2016) as well as perceived poor health or the presence of a chronic disorder (Vickerstaff, 2010; Mein et al., 2000; Monden, 2005), and more heterogeneous factors such as lower education, being single, physical inactivity and a high body mass index (Alavinia & Burdorf, 2008).

Few studies have investigated paid employment and mental health closer to retirement age: instead focusing on younger age groups (Butterworth et al., 2013), all working age groups (Martikainen et al., 2000, Ford et al., 2010, Weich & Lewis 1998), or on early retirement (Buxton et al., 2005). A study of Korean men aged 55 years and older found that those in paid employment had a lower prevalence of depressive symptoms than the non-employed group (Park et al., 2016), similar to findings from two US studies (Calvo, 2006; Glass et al., 2006), and to those from various multinational European surveys based on respondents aged 60 years and older (Choi et al., 2013; Di Gessa & Grundy, 2014); however, all relied on brief screening instruments as mental health measures or single questions as outcomes.

The aim of our study was to investigate the association between employment status and common mental disorder (CMD) among 50-64 year olds residing in Britain and its stability

over time, taking advantage of three national mental health surveys carried out in 1993, 2000 and 2007, and adjusting for sociodemographic and health related covariates. Because these repeated survey data were available, we sought to investigate the stability of this association. Although employment status can be considered and evaluated as a single exposure, the psychological impact of being in or out of employment is likely to be influenced by wider factors – both at an individual level (such as the need for an income) and at a regional or national level (such as societal expectations of employment and the value attached this, or the prospect of being able to find new employment if desired). Because the second set of factors are likely to vary with changes in the economic and/or social climate, there is no reason to assume that the association between paid employment and mental health in any age group will remain static over time (Kawachi et al., 2002; Wilkinson, 1996). Clarifying the degree of temporal stability is also an important consideration if survey findings are to be used as a basis for future policy, but this has received little or no investigation.

## **METHODS**

### **Data and sample**

The data for these analyses were drawn from three separate national surveys of psychiatric morbidity among adults living in private households: the British National Surveys of Psychiatric Morbidity of 1993, 2000 and 2007. The most recent 2007 survey was conducted by the National Centre for Social Research (NatCen) in collaboration with the University of Leicester while the two earlier surveys were carried out by the Office for National Statistics. The 1993 and 2000 surveys were carried out in England, Wales, and Scotland, whereas the 2007 survey was based in England only. The lower age limit for participation was 16 years for all three surveys, but the upper age limit varied: 64 years for the 1993 survey, 74 for the 2000 survey, and no upper limit for the 2007 survey. The surveys sought to use identical measures so as to maximise the comparability of results, and trends across the three surveys have been previously reported (Spiers et al., 2012).

The sampling methodology was comparable across all three surveys. All three employed independent random sampling across the geographic areas in question and none recruited previous participants or sampled from identical areas. In each, primary sampling units (postal sectors) were selected from the Small Users Postcode Address File, stratified for region and social-class composition to generate a nationally representative sample. Households were randomly selected from within each sampling unit, and in households containing at least one member in the age range for that survey, one person was randomly selected and invited to participate. Each person was only interviewed once. In 1993, 10,108 participants were interviewed (79.4% of those approached); in 2000, 8,580 (67.1%) participants were interviewed; and in 2007, 7,403 (56.2%) participants were interviewed. Our analysis focused on participants aged 50-64, and restricted all samples to residents in England, in order to maximise comparability across the three surveys and excluded those who never worked. The analysed sample contained 6,101 participants from the three surveys combined (2448 in 1993, 1874 in 2000, and 1779 in 2007).

### **Variables**

Employment status was the primary exposure of interest. In each survey participants were asked whether they had carried out any paid work in the preceding week of the interview, worked for wages, salary or other form of cash payment such as commission or tips, for any number of hours. 'Employment' in this context includes people absent from work in the

reference week because of holiday, sickness, strike or temporary lay-off, provided they had a job to return to with the same employer. It also includes people attending an educational establishment during the specified week if they were paid by their employer while attending it and people who worked in Government training schemes. People were classified as not in employment if they had been working in a voluntary capacity for expenses only, or only for payment in kind, unless they worked for a business, firm or professional practice owned by a relative. Responses to further questions on income earned from employment or self-employment used to cross-check employment status categorisation. Those who did not report any paid work in the week prior to the interview were asked about the reasons for non-employment in the last 4 weeks and for not being able to start work in the next 2 weeks. Categorised responses included being a student, looking after the family/home, being temporarily sick or injured, being long-term sick or disabled, or being retired from paid work. We distinguished between those not in paid work for health reasons (long term or temporary inability to work) and those not in paid work for other reasons (including studying, retirement, unemployment, or looking after the family/home).

Common mental disorder (CMD), as the primary outcome, was ascertained identically in all three surveys from the revised Clinical Interview Schedule (CIS-R) (Lewis et al., 1992), which is a widely used, fully-structured questionnaire with stem and supplementary questions enquiring in detail about the following 14 symptoms in the past week: somatic, fatigue, concentration/ forgetfulness, sleep problems, irritability, health worry, depression, depressive ideas, general worry, anxiety, phobias, panic, compulsions and obsessions. Each symptom schedule generates a 0-4 or 0-5 score based on frequency, duration and severity in the preceding week. A summed CIS-R score of 12 or more is conventionally taken to indicate CMD on the basis of the presence of significant neurotic symptoms of a level likely to impact on day-to-day functioning, cause distress, and be responsive to treatment (Lewis et al., 1992).

From previous literature we extracted covariates which were recognised to be associated with either or both paid work and CMD, and which had been ascertained in an identical manner in all three surveys. These included the following socio-demographic covariates: age, gender, marital status, education, social class, housing tenure, financial difficulty, smoking, and physical health. Participation in paid work tends not to decrease linearly with age so we used a categorical indicator of age group (50-54; 55-59; 60-64). Marital status was grouped into four categories: divorced/separated, married/cohabiting, single, and widowed. Respondents' highest educational qualifications were grouped into three categories: i) A-level and above

[implying a school leaving age of 18], ii) GCSE/GCE/O-level [implying a school leaving age of 16], and iii) no qualifications. Social class was determined by the respondents' primary occupation or most recent occupation (categorised into the I, II, III<sub>n</sub>, III<sub>M</sub>, IV, and V Registrar General classification; those who stated 'Armed forces' (9 respondents) or 'Never worked' (89 respondents) categories were excluded). Housing tenure was categorised as owned with a mortgage, owned outright, privately rented, and social housing. In addition, serious financial difficulty was defined as either a reported financial crisis in the previous six months or being behind with any payments. Self-reported smoking status was grouped into never smoked, ex-smoker and current smoker categories. Self-reported physical conditions had been ascertained using different approaches in the three surveys and these measures were considered too heterogeneous to use in this analysis. However, in all surveys participants were asked whether they had consulted a general practitioner in the previous 12 months for a physical health problem which was coded as a binary variable, and this was supplemented by scores for an activities of daily living (ADL) scale, identically administered in all three surveys and enquiring about difficulties in the following domains on a 0-2 scale: i) personal care; ii) using transport; iii) medical care; iv) household activities; v) practical activities; vi) paper work; vii) money. Because of the distribution of scores in the sample age group, a binary variable was created indicating some difficulty or lot of difficulty for at least one ADL domain.

### **Statistical analysis**

Consistent with previous cross-survey publications, analyses were not weighted, as surveys used a different weighting scheme across the three surveys precluding comparisons of estimates over time (Lynn, 2011). We first assessed bivariate associations between all covariates and paid employment, followed by unadjusted logistic regression analyses, assessing the bivariate associations between our key independent variable and all covariates and CMD. Those factors that were statistically significant ( $p < 0.05$ ) at least in one survey, were included in multivariable logistic regression models to investigate the association of interest between employment status and CMD. All regression analyses were carried out for individual survey years and statistical interactions by survey year were assessed using likelihood ratio tests. Further sensitivity analyses stratified final models by gender to investigate gender differences in the relationship between employment status and CMD.



## RESULTS

Characteristics of the employed/non-employed groups are summarised in Table 1. Prevalence of paid employment for the sample age group in the 1993, 2000 and 2007 surveys were 52%, 60% and 62% respectively. Of those in employment, the proportions working full-/part-time did not vary substantially across survey years. Among those not in paid work, sickness-related reasons were cited most commonly in 2000 (30.9% of cases) compared to 1993 (22.7%) and 2007 (25.4%). The overall prevalence of CMD was higher in 2000 (17%) relative to 1993 (13%) or 2007 (16%), and was highest in the non-employed group in all three surveys. Proportion of males in paid-employment was consistently higher than those in non-employment in all three surveys, and over two thirds of those in paid-employment were married or cohabiting, higher than in the non-employed group in all three surveys. Paid employment was also associated with higher education, higher socio-economic status and home ownership in all three surveys. Proportions who had seen a GP within the last 12 months were higher in the non-employed than the employed group, as was the presence of ADL impairment, in all survey years.

Unadjusted associations between covariates and CMD are summarised in Table 2. In all three surveys, CMD was associated with being younger, female, being widowed or divorced/separated, having no educational qualifications, having worked in an unskilled occupation, living in privately rented accommodation, reporting serious debt in the past 12 months, being a current smoker, having seen a GP over the previous 12 months for a physical health problem, and presence of ADL impairment. No evidence was found for an interaction between employment status and survey year (likelihood ratio test: chi squared 1.86, p-value 0.394). In terms of employment status, non-employment as a whole was associated with CMD in all survey years, but this association appeared to be accounted for entirely by those who were not employed for health-related reasons and was not apparent in those citing other reasons for non-employment.

The association between non-employment and CMD was further investigated with successive adjustments in multiple logistic regression models and findings are summarised in Table 3. Non-employment due to health reasons remained significantly associated with CMD after accounting for all covariates. However, the associations between non-employment for other reasons and CMD were weak and not statistically significant in any sample. Overall model strengths were similar across survey years with minimal variation in pseudo  $R^2$  coefficients.

The odds ratio for the association between non-employment due to ill health and CMD rose from 3.05 in 1993 to 3.56 in 2000, followed by a decrease to 2.80 in 2007 when adjusted for sociodemographic, socioeconomic and physical health issues, but confidence intervals were overlapping. As summarised in table 3, the largest changes (diminutions) in the odds ratios for the association of interest were observed following adjustment for the presence of at least one difficulty in activities of daily living, and further adjustment for physical health consultation had only minor impact.

There were no consistent gender differences in the strengths of association between non-employment for health reasons and CMD. Considering short-term and long-term ill health reasons for non-employment, numbers were insufficient to analyse separately between surveys. Combining the surveys (table 4), fully-adjusted odds ratios for CMD, compared to paid employment, were 3.84 (1.97-7.47) for non-employment due to short-term health reasons, and 2.99 (2.36-3.80) for non-employment due to long-term health reasons. In terms of gender, higher odds ratios for CMD were observed in males than females in the combined surveys for both non-employment due to short-term and long-term sickness reasons, although confidence intervals overlapped (table 4).

## DISCUSSION

In summary, in these three large national surveys of people aged 50-64 years, we found an excess prevalence of CMD in those who were not in paid employment. However, these associations were only present for people who characterised their non-employment as due to ill-health, and no associations were observed with non-employment for other reasons.

Loss of employment has long been considered an important factor in the development of depression (Mirowsky & Ross, 1992). Considering pre-retirement age groups, a negative association was found between paid employment and depression among 50-69 year olds using the 12-item EURO-D scale in Denmark (odds ratio 0.68), France (0.79) and Italy (0.66), and using the Centre for Epidemiologic Studies Depression (CES-D) scale in England (0.74) (Di Gessa & Grundy, 2014). Furthermore, an analysis of longitudinal data from the US Health and Retirement Study, found that people aged 50-69 in paid work had reduced depressive symptoms measured using the CES-D scale and better perceived well-being when compared with those out of the labour market (Calvo, 2006). Using the longer Composite International Diagnostic Instrument (CIDI) in an Australian national survey, higher levels of mental disorder were found in men close to retirement age who were not working for pay compared to paid workers (Butterworth et al., 2006). However, we found that CMD was only associated with non-employed status when the latter was reported as due to health reasons, and people who were non-employed for other cited reasons had no evidence of better or worse mental health. This finding was consistent across all three surveys. Clearly it should be borne in mind that it was not possible to distinguish between mental or physical disorders when asking about reasons for non-employment, and the CMD observed may be pre-existing. While there was no evidence for any difference between short- or long-term sicknesses as reported reasons for non-employment, further research should continue to disentangle the relationship between physical and mental health to identify their separate and combined relationships with non-employment.

Gender has been suggested to modify associations of paid employment with mental health because of proposed differences in perceived identity, interpersonal relationships, and social stigmatization (Graetz, 1993). Specifically, non-employment has been reported to have a weaker mental health impact on women, proposed as due to differences in the way jobs are valued and compensatory self-esteem gained from family roles (Dew et al., 1992). However, a more recent study found a greater gender difference in depression (with women at increased

risk) in 50 to 69 year old people who were working compared to those who were non-employed (Lamberg et al., 2010). We found a strong association between non-employment due to ill health and CMD for both men and women and no evidence of any gender difference in this.

The associations between non-employment for other reasons (including studying, retirement, unemployment, or looking after the family/home) and CMD were weak and not statistically significant in the three survey samples. One possible explanation is that there are balancing effects of voluntary and involuntary non-employment in this group. On the other hand, there is evidence of improvement in mental health shortly after voluntary retirement (Westerlund et al., 2010). On the other hand, obligatory work later in life when many peers are retiring, may not be as positive an experience as that earlier in life (McDonnall, 2011), and several studies have reported the importance of choice in determining whether work will benefit well-being (Calvo et al., 2009; Christ et al., 2007).

The association between employment status and mental health in mid-life is important, given increasing employment within these age groups and rises in the statutory pension age. In this respect, it is noteworthy that there was a substantial increase in the prevalence of paid employment within our sampled age range across the three survey years from 52% in 1993, 60% in 2000 and 62% in year 2007. As described earlier, we were specifically interested in describing the stability over time of the association between paid employment status and CMD, but actually found little evidence of change over the survey years, despite changes in paid employment prevalence. The only exception was a particularly strong association between non-employment due to ill-health and CMD in men in the 2000 survey compared to the other two-time points. This might be a chance finding because of relatively small cell sizes and multiple stratified analyses, and it should be borne in mind that confidence intervals overlapped. However, it is noteworthy that associations with other CMD risk factors were also more often than not strongest in the 2000 survey despite identical sampling and measurement. One potentially relevant fact is that the national economy was growing fastest in 2000 compared to 1993 and 2007, midway between two downturns. Risk factors for mental disorder might exert a stronger effect if people affected feel more isolated from societal optimism, and/or during periods of heightened actual or perceived socioeconomic inequality (Wilkinson & Pickett, 2010), and there is some evidence that societies with the highest socio-economic inequalities tend to have high prevalence of mental illnesses (Friedli,

2009; Marmot, 2010). However, this hypothesis remains tentative and would need re-evaluation in independent samples.

Strengths of this study include the three large surveys which achieved national coverage and employed comparable sampling techniques, as well as a number of measurements administered in an identical manner in all participants, including those of employment status and CMD. The CIS-R is a widely used measure with detailed questions on individual symptom domains, thus more accurate than brief screening scales. The surveys included extensive questions on sociodemographic information including reported financial problems and tenure. Much of the past international literature focuses on either physical or mental health, and does not control for both. For example, one study analysed the impact of mental health on labour supply in the USA (Ojeda et al., 2010), but did little to control for the physical health characteristics of the individuals in their sample, whereas our study adjusted for several physical health indicators.

Concerning limitations, the cross-sectional design only allows co-occurrence of non-employment and CMD to be quantified, and does not permit causal inferences. In addition, the prevalence of CMD is influenced both by the incidence and the duration of case status, constructs which also cannot be distinguished. Furthermore, assessment of confounding was limited because covariates could only be included if they had been measured consistently across the three surveys. Missing measurements included those of specific physical health disorders and medication (which were not identically ascertained across the surveys), and information was insufficient to capture the full complexity of social activities and unpaid employment experience (e.g. voluntary work or caring for family), which are clearly potentially relevant. Although the questionnaire defined employment status over the preceding week rather than whether or not people were actually in work at that time, it was not sufficiently detailed to allow differentiation of sickness-related causes of non-employment apart from the 'short-term' vs. 'long-term' dichotomy, and there was no facility to link to actual employment records or account for the type of employment contract. It is recognised that workers experiencing temporary and limited time contracts can experience greater pressures to fulfil duties in shorter time periods, and Hesselink and van Vuuren (1999) found that 44% of fixed-term workers in The Netherlands worried about job insecurity compared with 16% of permanent contract workers.

In conclusion, we found that people aged 50-64 years who were not in paid employment for reasons of ill-health were more likely to have CMD, but there were no differences in CMD prevalence between those employed or non-employed for other reasons. Associations had been relatively stable in strength from 1993 to 2007 despite quite marked changes in the employment status of this age group and in the national economy, although further monitoring (including forthcoming data from the 2014 national survey) would be worthwhile to monitor temporal stability if data of this sort are used to inform policies around statutory retirement ages and support for those who leave work early.

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**Table 1: Description of the sample by employment status and year of survey**

Variable	1993		P value	2000		P value	2007		P value
	In paid Employment	Not in paid Employment		In paid Employment	Not in paid Employment		In paid Employment	Not in paid Employment	
<b>Number</b>	1279	1169		1123	751		1111	668	
<b>Common mental disorder present</b>	126 (9.9)	195 (16.7)	<0.001	130 (11.6)	189 (25.2)	<0.001	134 (12.1)	155 (23.2)	<0.001
<b>Type of employment</b>									
Full time	869 (67.9)			795 (70.8)			787 (70.8)		
Part time	410 (32.1)			328 (29.2)			324 (29.2)		
Non-employed									
Health-related non-employment		265 (22.7)			232 (30.9)			170 (25.4)	
Other reason		904 (77.3)			519 (69.1)			498 (74.6)	
<b>Age (years)</b>			<0.001			<0.001			<0.001
50- 54	561 (43.9)	216 (18.5)		533 (47.5)	168 (22.4)		417 (37.5)	113 (16.9)	
55- 59	429 (33.5)	326 (27.9)		358 (31.9)	223 (29.7)		396 (35.6)	209 (31.3)	
60- 64	289 (22.6)	627 (53.6)		232 (20.7)	360 (47.9)		298 (26.8)	346 (51.8)	
<b>Gender</b>			<0.001			<0.001			<0.001
Male	641 (50.1)	472 (40.4)		578 (51.5)	274 (36.5)		538 (48.4)	252 (37.7)	
Female	638 (49.9)	697 (59.6)		545 (48.5)	477 (63.5)		573 (51.6)	416 (62.3)	
<b>Marital status</b>			<0.001			<0.001			<0.001
Divorced/separated	158 (12.4)	156 (13.4)		223 (19.9)	167 (22.2)		169 (15.2)	124 (18.6)	
Married/cohabiting	929 (73.0)	766 (65.9)		756 (67.3)	434 (57.8)		795 (71.6)	414 (62.0)	
Single	83 (6.5)	101 (8.7)		85 (7.6)	55 (7.3)		79 (7.1)	61 (9.1)	
Widowed	102 (8.0)	140 (12.0)		59 (5.3)	95 (12.6)		68 (6.1)	69 (10.3)	

<b>Highest qualification</b>			<0.001			<0.001			<0.001
A-level or above	280 (21.9)	124 (10.6)		331 (29.5)	133 (17.7)		477 (43.1)	161 (24.3)	
GCSE/GCE/O-level/other	521 (40.7)	437 (37.4)		362 (32.2)	227 (30.2)		347 (31.3)	195 (29.4)	
No qualifications	478 (37.4)	608 (52.0)		430 (38.3)	391 (52.1)		283 (25.6)	307 (46.3)	
<b>Social class by occupation</b>			0.002			<0.001			0.003
Professional/managerial/clerical	658 (51.4)	539 (46.1)		695 (61.9)	396 (52.7)		709 (63.8)	375 (56.1)	
Skilled/partly skilled	558 (43.6)	541 (46.3)		381 (33.9)	293 (39.0)		344 (31.0)	242 (36.2)	
Unskilled	63 (4.9)	89 (7.6)		47 (4.2)	62 (8.3)		58 (5.2)	51 (7.6)	
<b>Housing tenure</b>			<0.001			<0.001			<0.001
Owned with a mortgage	616 (48.2)	279 (23.9)		552 (49.2)	161 (21.5)		471 (42.6)	123 (18.4)	
Owned outright	417 (32.6)	518 (44.3)		434 (38.6)	369 (49.3)		484 (43.8)	335 (50.2)	
Private or other renter	82 (6.4)	49 (4.2)		44 (3.9)	31 (4.1)		67 (6.1)	35 (5.2)	
Social housing	164 (12.8)	323 (27.6)		93 (8.3)	187 (25.0)		83 (7.5)	174 (26.1)	
<b>Serious debt in the last year</b>	51 (4.0)	48 (4.1)		49 (4.4)	72 (9.6)		37 (3.3)	53 (7.9)	
<b>Seen a doctor for physical health problem in the last 12 months</b>	823 (64.3)	883 (75.5)	<0.001	741 (66.0)	559 (74.4)	<0.001	717 (64.5)	498 (74.6)	<0.001
<b>Smoking status</b>			<0.001			<0.001			0.024
No smoker	315 (24.6)	362 (31.0)		246 (21.9)	219 (29.2)		217 (19.5)	167 (25.0)	
Ex-smoker	639 (50.0)	521 (44.6)		633 (56.4)	359 (47.8)		553 (49.8)	306 (45.8)	
Current smoker	325 (25.4)	286 (24.5)		244 (21.7)	173 (23.0)		341 (30.7)	195 (29.2)	
At-least one ADL impaired	191 (14.9)	427 (36.5)	<0.001	157 (14.0)	330 (43.9)	<0.001	327 (29.4)	351 (52.5)	<0.001

**Table 2: Unadjusted logistic regression analyses of factors associated with common mental disorder (CMD) in 50-64 year olds in England in the three national psychiatric morbidity surveys**

Exposure	1993 survey			2000 survey			2007 survey		
	n	OR (95% CI)	P value	n	OR (95% CI)	P value	n	OR (95% CI)	P value
<b>Age (years)</b>	2448			1874			1779		
50- 54		Ref.			Ref.			Ref.	
55- 59		0.77 (0.58- 1.03)	0.07		0.73 (0.55- 0.98)	0.04		0.99 (0.74- 1.33)	0.95
60- 64		0.61 (0.46- 0.81)	<0.001		0.65 (0.48- 0.87)	<0.001		0.43 (0.31- 0.61)	<0.001
<b>Female gender</b>	2448	1.44 (1.13- 1.84)	<0.001	1874	1.43 (1.12- 1.83)	0.01	1779	1.57 (1.21- 2.04)	<0.001
<b>Marital status</b>									
Married/cohabiting	2435	Ref.		1874	Ref.		1779	Ref.	
Single		0.78 (0.46- 1.34)	0.37		1.5 (0.95- 2.37)	0.08		1.57 (1- 2.46)	0.05
Widowed		1.82 (1.27- 2.62)	<0.001		2.23 (1.50- 3.33)	<0.001		2.08 (1.36- 3.18)	<0.001
Divorced/separated		2.62 (1.94- 3.54)	<0.001		2.18 (1.64- 2.89)	<0.001		2.02 (1.47- 2.77)	<0.001
<b>Highest level of qualification</b>	2448			1874			1779		
A/Level and above		Ref.			Ref.			Ref.	
GCSE/GCE/O-level/other		0.97 (0.67- 1.41)	0.88		2.41 (1.67- 3.47)	<0.001		1.3 (0.93- 1.82)	0.13
No qualifications		1.50 (1.06- 2.13)	0.02		2.13 (1.5- 3.04)	<0.001		2.16 (1.59- 2.95)	<0.001
<b>Social class by occupation</b>	2448			1874			1779		
Professional/managerial/clerical		Ref.			Ref.			Ref.	

Skilled/partly-skilled occupations		1.18 (0.92- 1.52)	0.18		1.31 (1.02- 1.69)	0.04		1.37 (1.05- 1.79)	0.02
Unskilled		2.19 (1.44- 3.34)	<0.001		1.95 (1.23- 3.1)	<0.001		1.15 (0.68- 1.96)	0.61
<b>Housing tenure</b>	2448			1871			1772		
Owned outright		Ref.			Ref.			Ref.	
Owned with a mortgage		1.41 (1.05- 1.89)	0.02		1.64 (1.22- 2.2)	<0.001		1.01 (0.74- 1.38)	0.97
Private or other renter		2.28 (1.67- 3.11)	<0.001		4.05 (2.91- 5.65)	<0.001		3.17 (2.28- 4.42)	<0.001
Social housing		1.59 (0.94- 2.71)	0.09		1.84 (0.99- 3.43)	0.05		1.52 (0.89- 2.61)	0.13
<b>Serious debt in the last year</b>	2448	2.62 (1.66- 4.15)	<0.001	1874	3.60 (2.44- 5.29)	<0.001	1779	3.41 (2.18- 5.34)	<0.001
<b>Seen a doctor for physical health problem in the last 12 months</b>	2398	2.36 (1.73- 3.23)	<0.001	1874	2.81 (2.04- 3.88)	<0.001	1779	2.59 (1.87- 3.58)	<0.001
<b>Smoking status</b>									
No smoker	2448	Ref.		1874	Ref.		1779	Ref.	
Ex-smoker		0.90 (0.65- 1.24)	0.51		0.97 (0.7- 1.34)	0.85		1.10 (0.81- 1.5)	0.55
Current smoker		2.27 (1.65- 3.11)	<0.001		1.74 (1.24- 2.45)	<0.001		1.91 (1.36- 2.69)	<0.001
<b>Type of employment</b>	2448			1874			1779		
Full time		Ref.			Ref.			Ref.	
Part time		1.29 (0.88- 1.9)	0.19		1.18 (0.8- 1.75)	0.41		1.00 (0.67- 1.48)	0.99
Not in employment		2.00 (1.52- 2.64)	<0.001		2.70 (2.05- 3.56)	<0.001		2.20 (1.66- 2.91)	<0.001
<b>Reason for non-employment</b>	2448			1874			1779		

In paid employment		Ref.			Ref.			Ref.	
Health-related non-employment		5.03 (3.68- 6.87)	<0.001		8.18 (5.97- 11.22)	<0.001		7.29 (5.13- 10.35)	<0.001
Other reasons		1.15 (0.87- 1.52)	0.32		1.17 (0.86- 1.6)	0.32		1.19 (0.87- 1.63)	0.27
<b>At-least one ADL impaired</b>	2448	4.15 (3.26- 5.30)	<0.001	1874	4.84 (3.76- 6.23)	<0.001	1779	5.80 (4.38- 7.69)	<0.001

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**Table 3: Odds ratios of ‘reason for non-employment’ association with CMD adjusted for various factors for 3 surveys**

Adjustments	Reason for non-employment	1993 (n=2385)			2000 (n=1871)			2007 (n=1771)		
		OR	P value	Pseudo R2	OR	P value	Pseudo R2	OR	P value	Pseudo R2
Model 1: Age, gender and marital status	In paid employment	Ref			Ref			Ref		
	Health	6.27 (4.46- 8.83)	<0.001	0.09	8.72 (6.25- 12.2)	<0.001	0.13	7.28 (5.01- 10.6)	<0.001	0.11
	Other	1.30 (0.96- 1.77)	0.09		1.25 (0.89- 1.77)	0.20		1.48 (1.05- 2.08)	0.02	
Model 2: Model 1+ education, social class, housing tenure and serious debt	In paid employment	Ref			Ref			Ref		
	Health	5.83 (4.06- 8.38)	<0.001	0.10	7.01 (4.88- 10.1)	<0.001	0.15	5.30 (3.49- 8.04)	<0.001	0.12
	Other	1.30 (0.96- 1.78)	0.09		1.24 (0.86- 1.77)	0.25		1.29 (0.91- 1.82)	0.16	
Model 3: Model 2+ smoking status	In paid employment	Ref			Ref			Ref		
	Health	5.63 (3.90- 8.12)	<0.001	0.12	6.92 (4.82- 9.93)	<0.001	0.15	5.29 (3.45- 8.12)	<0.001	0.12
	Other	1.30 (0.95- 1.77)	0.10		1.26 (0.88- 1.80)	0.21		1.27 (0.90- 1.81)	0.18	
Model 4: Model 3+ ADL impairment	In paid employment	Ref			Ref			Ref		
	Health	3.28 (2.21- 4.85)	<0.001	0.14	4.04 (2.70- 6.05)	<0.001	0.17	3.02 (1.95- 4.68)	<0.001	0.18
	Other	1.17 (0.85- 1.60)	0.35		1.14 (0.79- 1.64)	0.48		1.10 (0.76- 1.58)	0.63	
Model 5: Model 4+ physical health consultation	In paid employment	Ref			Ref			Ref		
	Health	3.05 (2.05- 4.55)	<0.001	0.15	3.56 (2.36- 5.36)	<0.001	0.18	2.80 (1.81- 4.36)	<0.001	0.19
	Other	1.16 (0.85- 1.60)	0.35		1.13 (0.79- 1.64)	0.49		1.09 (0.76- 1.58)	0.64	



**Table 4: Odds ratios of ‘reason for non-employment’ association with CMD adjusted for various factors for combined survey<sup>\$</sup>**

Reason for non-employment	Male (n=2,705)		Female (n=3,314)		All* (n=6,019)	
	OR	P value	OR	P value	OR	P value
In paid employment	Ref.		Ref.		Ref.	
Short-term sick	5.42 (2.32- 12.63)	<0.001	2.24 (0.75- 6.69)	0.15	3.84 (1.97- 7.47)	<0.001
Long-term sick	3.67 (2.57- 5.22)	<0.001	2.32 (1.66- 3.23)	<0.001	2.99 (2.36, 3.80)	<0.001
Non-employed other	1.16 (0.81- 1.68)	0.42	1.10 (0.86- 1.39)	0.45	1.11 (0.91- 1.36)	0.29

\*Further adjusted for gender; <sup>\$</sup> adjusted for all variables in model 5 in table 3 except gender