

Socio-economic position and common mental disorders

Longitudinal study in the general population in the UK

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Background Individuals in lower socio-economic groups have an increased prevalence of common mental disorders.

Aims To investigate the longitudinal association between socio-economic position and common mental disorders in a general population sample in the UK.

Method Participants ($n=2406$) were assessed at two time points 18 months apart with the Revised Clinical Interview Schedule. The sample was stratified into two cohorts according to mental health status at baseline.

Results None of the socio-economic indicators studied was significantly associated with an episode of common mental disorder at follow-up after adjusting for baseline psychiatric morbidity. The analysis of separate diagnostic categories showed that subjective financial difficulties at baseline were independently associated with depression at follow-up in both cohorts.

Conclusions These findings support the view that apart from objective measures of socio-economic position, more subjective measures might be equally important from an aetiological or clinical perspective.

Declaration of interest None.

Previous cross-sectional studies have shown that people in lower socio-economic groups have an increased prevalence of common mental disorders (Holzer *et al*, 1986; Bijl *et al*, 1998; Davey Smith *et al*, 1998; Lewis *et al*, 1998; Muntaner *et al*, 1998; Weich & Lewis, 1998a). Cross-sectional studies cannot distinguish whether low socio-economic position is associated with the development of new episodes of common mental disorders, with increased duration of episodes or both (Muntaner *et al*, 2004). Psychiatric disorders often show a chronic course (Sargeant *et al*, 1990) and it is likely that patients in the lower socio-economic groups might have a worse prognosis rather than an increased risk of a new episode of disorder (Lewis *et al*, 1998). Previous longitudinal studies have generally supported this observation (Weich & Lewis, 1998b) and a recent meta-analysis found stronger evidence in favour of an association with increased duration (Lorant *et al*, 2003). However, other studies have found that low socio-economic position may be a risk factor for the development of a new episode (Kaplan *et al*, 1987; Bruce *et al*, 1991). These conflicting results may be explained by the different samples and method used, and the inability to adjust for a number of potential confounders. In particular, it is not clear whether all previous studies adjusted for baseline psychiatric symptoms, even though this variable shows a strong association with persistence of disorder (Sargeant *et al*, 1990; Spijker *et al*, 2001). Similarly, sub-threshold symptoms may confound the association between low socio-economic position and development of a new episode of disorder. Clarifying whether low socio-economic position is associated with increased risk of a new episode of common mental disorder or with worse prognosis is critical from both an aetiological point of view and a public health perspective. The aim of our study was to investigate this issue in a longitudinal, general-population

study in the UK. Based on the previous findings we predicted that participants of lower socio-economic position would be more likely to report an episode of a common mental disorder at follow-up and that this association would be stronger in those who were categorised as cases at baseline compared with non-cases.

METHOD

Data-set

The longitudinal study reported here was conducted in the UK by the Office for National Statistics (ONS). The 2000 Psychiatric Morbidity Survey aimed to estimate the prevalence of common mental disorders and the use of services of adults, aged 16–74 years, living in private households in Great Britain (Singleton *et al*, 2001). The sample was drawn from the small-user Postcode Address File using a two-stage approach. Initially, postcode sectors were stratified on the basis of socio-economic status within region and 438 sectors selected with a probability proportional to size. Then, within each selected sector, 36 addresses were randomly selected for inclusion in the survey. Interviewers visited each address to identify private households with at least one person aged 16–74 years and then one person per household was randomly selected for interview. The main fieldwork took place between March and September 2000 and interviews were available for 8580 individuals (67% response rate).

Eighteen months later 3536 of the original respondents (all of those with a definite or sub-threshold psychiatric disorder and a 20% random sample of those without such disorder) were contacted for a follow-up interview and 2413 were successfully re-interviewed (68% response rate). Non-participants included 620 people who could not be traced or contacted (18%) and 503 who refused (14%). Non-participants were slightly more likely to be younger and of lower socio-economic status (Singleton & Lewis, 2003). Owing to some incomplete interviews, the present study reports findings from the 2406 individuals for whom full data were obtained on both occasions. Ethical approval for the survey work was obtained from the Multi-Centre Research Ethics Committees in England. Further details of the survey method are available elsewhere (Singleton & Lewis, 2003).

Measurement of psychiatric morbidity

Revised Clinical Interview Schedule

Psychiatric morbidity in the week preceding interview was assessed using the Revised Clinical Interview Schedule (CIS-R; Lewis *et al*, 1992), a structured interview designed to be used by trained lay personnel. It can provide data on the prevalence of 14 symptoms, six ICD-10 disorders (depressive episode, phobias, generalised anxiety disorder, panic disorder, obsessive-compulsive disorder, mixed anxiety and depression disorder; World Health Organization, 1992) and the distribution of total CIS-R scores, which gives an indication of severity of symptoms in a dimensional way. The CIS-R was selected because it had been used in the first nationally representative general population survey of psychiatric morbidity in the UK made in 1993 by the Office for National Statistics (Jenkins *et al*, 1997). It has been used in several other surveys around the world and is comparable to other structured interviews used in epidemiological surveys, such as the Composite International Diagnostic Interview (CIDI; Robins *et al*, 1988). The reliability of the CIS-R has been studied in primary care samples and the kappa coefficient of reliability was reported to be 0.72 (95% CI 0.65–0.79) (Lewis *et al*, 1992).

Diagnoses

Diagnoses of ICD-10 disorders were derived by applying specific algorithms that had been developed in a previous general population survey (Jenkins *et al*, 1997) according to the ICD-10 diagnostic criteria for research (World Health Organization, 1992). All diagnoses refer to the 7 days before the interview. It should be noted that the diagnosis of 'mixed anxiety and depression' (ICD-10 code F41.2) refers to a clinically important disorder (not sub-threshold disorder) that does not meet criteria for another anxiety or depressive disorder. The ICD-10 does not include specific diagnostic criteria for this condition, but suggests that researchers should use their own depending upon the setting and the purpose of their study. For this reason we defined as cases of mixed anxiety and depression all those scoring 12 or more on the CIS-R who did not meet criteria for any other anxiety or depressive disorder. In order to avoid confusion with depressive disorder comorbid with anxiety disorders, in the tables we

refer to this condition as 'non-specific psychiatric morbidity'. The threshold of 12 or more was selected because it has been found to represent the level of clinically important symptoms in the UK (Lewis *et al*, 1992). We included these patients in our analysis because previous psychiatric morbidity surveys had shown that mixed anxiety and depression was the most common disorder in the UK general population, with a weekly prevalence of approximately 9% (Singleton *et al*, 2001). In addition, there is increasing research interest in mild disorders, and a recent analysis of the National Comorbidity Survey in the USA underlined the clinical importance of milder forms of mental disorders (Kessler *et al*, 2003).

Definition of common mental disorders

In our main analysis we combined all cases of participants meeting criteria for at least one definite ICD-10 disorder (of the six we assessed with the CIS-R) into the category of 'common mental disorders'. Individuals with probable psychotic disorder at baseline were excluded from the analysis. Our two main reasons for combining cases of psychiatric disorder in this common category were, first, that previous research in the UK has shown that the psychiatric problems seen in the community or primary care settings are better described by one or two highly correlated dimensions of depression and anxiety (Goldberg *et al*, 1987; Jacob *et al*, 1998), and second, that the power of the study was greatly improved by this categorisation. However, to make our results more clinically relevant, we also present analyses using separate ICD-10 diagnostic categories as the dependent variable. Three analyses are presented in this respect:

- cases of ICD-10 depressive episode;
- cases of any anxiety disorder;
- cases of non-specific psychiatric morbidity (i.e. all those meeting criteria for mixed anxiety and depression as defined previously).

Measurement of socio-economic position

Social class

Occupational social class was defined according to the UK Registrar General's classification and was based on the participant's current (or most recent) occupation. Participants were classified into four

categories: professionals or intermediate occupations (I, II), non-manual skilled occupations (III non-manual), manual skilled occupations (III manual) and partly skilled occupations or unskilled occupations (IV, V). Social class was not determined if the person had never worked or was a full-time student, or if the occupation was inadequately described. For this reason, in the analysis we added a fifth category corresponding to the missing values of this variable.

Education

Educational qualifications (based on highest level attained) were classified in four groups: university degree, teaching or nursing qualifications, including honorary degrees; A-level qualifications; General Certificate of Secondary Education (GCSE) or equivalent; no qualification.

Standard of living

Three variables were selected *a priori* to provide an assessment of each participant's material standard of living: household gross income, housing tenure and ability to pay for everyday needs. Weekly household gross income was classified in three groups: £400 or more, less than £400 but £200 or more and less than £200. Housing tenure status was classified into three categories: owners, renters from the private sector and renters from the public sector. Finally, participants were asked a series of questions related to their ability to pay for their everyday needs in the year preceding interview. These included questions on whether they were seriously behind in paying bills, credit card debts, mortgage repayments and loans; whether they had been subjected to disconnection by a utility company or had used water, gas, electricity or the telephone less because they could not afford it; and whether they had borrowed money from unofficial sources in order to pay for their everyday needs. People who reported at least one difficulty in these areas were classified as having experienced financial difficulties.

To overcome the problem of colinearity between income and housing tenure status, we derived a composite index of material standard of living by adding these two indicators. We assigned numerical values to each group of income and tenure status and added the two variables. The score on the composite index ranged from 1 (wealthiest) to 6 (poorest) with a mean of

3.16 (s.d.=1.52) and a median of 3. We analysed the question about financial difficulties separately because of the more subjective nature of this measure and also because previous research has shown that it may be different in nature from the other two (Weich & Lewis, 1998b).

Other variables

We used information on the following variables: age (in 10-year intervals); gender; marital status (in five categories: married, separated, single, divorced, widowed); type of family unit (in five categories: couple without children, couple with children, lone parent, one person only, adult with parents); employment status (in three categories: working full-time or part-time, unemployed, economically inactive).

Statistical analysis

We stratified the sample by case status at baseline and carried out separate logistic regression analyses for the two cohorts of non-cases and cases of common mental disorders. First, we examined the association between socio-economic position and meeting criteria at the follow-up assessment (time 2) for an episode of common mental disorder in the cohort of non-cases ($n=1656$). We then examined this association in the cohort of cases ($n=750$). These two analyses were our best approximations of the terms 'onset' and 'persistence' of common mental disorders as used by other papers in the past (Weich & Lewis, 1998b; Lorant *et al.*, 2003). We consider the limitations of this approximation in the Discussion section below.

We present three types of odds ratios: crude odds ratios, odds ratios adjusted for all other socio-economic indicators and other socio-demographic variables, and odds ratios further adjusted for baseline CIS-R score. The `svy` commands in Stata version 7.0 for Windows were used for the analysis. Probability weights were used to take account of the stratified sampling procedure and non-response (Singleton & Lewis, 2003).

RESULTS

Baseline socio-demographic and socio-economic characteristics of the sample are presented in Table 1 and the sample's clinical characteristics are given in Table 2. The most significant predictor of a new episode

Table 1 Socio-demographic and socio-economic characteristics of the study sample

Variable	Total ($n=2406$)	Free from disease at baseline ($n=1656$)	Cases at baseline ($n=750$)
Sociodemographic variables, n (%)¹			
Age, years			
16–24	218 (12.9)	154 (12.5)	64 (14.7)
25–34	485 (20.5)	327 (20.0)	158 (23.4)
35–44	526 (19.5)	366 (19.4)	160 (20.6)
45–54	497 (20.3)	321 (19.9)	176 (22.0)
55–64	376 (14.1)	241 (14.1)	135 (13.8)
65–74	304 (12.6)	247 (14.0)	57 (5.4)
Gender			
Male	1020 (49.3)	745 (50.8)	275 (40.9)
Female	1386 (50.7)	911 (49.2)	475 (59.1)
Employment status			
Full-time/part-time	1468 (66.5)	1078 (68.1)	390 (57.7)
Economically inactive	845 (30.3)	523 (28.9)	322 (37.6)
Unemployed	80 (2.9)	49 (2.7)	31 (4.1)
Missing data	13 (0.3)	6 (0.3)	7 (0.6)
Socio-economic variables			
Material standard of living score: mean (s.d.) ²	2.79 (0.04)	2.70 (0.05)	3.26 (0.07)
Any financial difficulties in past 12 months, n (%)			
No	1654 (78.4)	1248 (82.6)	406 (55.0)
Yes	731 (21.1)	399 (16.9)	332 (43.9)
Missing data	21 (0.5)	9 (0.5)	12 (1.1)
Educational qualifications, n (%)			
Degree	589 (25.8)	424 (26.4)	165 (22.5)
A-level	315 (14.6)	220 (14.5)	95 (14.9)
GCSE or equivalent	838 (35.5)	586 (35.5)	252 (35.5)
No qualifications	650 (23.8)	419 (23.3)	231 (26.5)
Missing data	14 (0.3)	7 (0.3)	7 (0.6)
Social class, n (%)			
I/II	879 (38.4)	638 (39.6)	241 (31.3)
III non-manual	555 (23.3)	380 (22.9)	175 (25.1)
III manual	429 (17.2)	307 (17.3)	122 (17.1)
IV/V	472 (16.8)	286 (15.7)	186 (22.7)
Missing data	71 (4.3)	45 (4.5)	26 (3.8)

GCSE, General Certificate of Secondary Education.

1. Actual number of participants. Percentages in comparison were weighted to account for the stratified random sampling and non-response.

2. Data were missing for 21 participants.

of common mental disorder in participants free from disease at baseline ('new onsets') was the score on the CIS-R (Table 3). Social class was not associated with an increased risk of a new episode even in the crude analysis. Lower educational qualifications showed a trend for an increased risk of a new episode but this was not statistically significant. Participants with a lower

material standard of living were more likely to develop a new episode of a common mental disorder in the crude analysis but this was no longer significant after adjustment for the other variables in the model. In contrast, those reporting financial difficulties at baseline had an increased risk of a new episode even after adjustment (model 1, Table 3). However, in the final

Table 2 Clinical characteristics of the study sample

Clinical variables	Time 1 (baseline) (n=2406)	Time 2	
		Free from disease at baseline (n=1656)	Cases at baseline (n=750)
CIS-R score			
Range	0–49	0–41	0–48
Mean (s.d.)	9.5 (8.2)	4.8 (5.8)	13.2 (9.4)
Median	8	3	12
Presence of disorder, n (%) ¹			
Any ICD-10 disorder ²	750 (15.5)	184 (6.3)	383 (50.1)
Depression	133 (2.6)	26 (1.1)	76 (9.4)
Any anxiety disorder	336 (6.4)	70 (2.7)	182 (22.7)
GAD	220 (4.3)	51 (1.8)	125 (15.5)
OCD	60 (1.1)	12 (0.4)	24 (3.4)
Panic disorder	41 (0.8)	9 (0.05)	27 (3.0)
Phobias	86 (1.6)	13 (0.05)	55 (6.5)
Non-specific psychiatric morbidity ³	425 (9.17)	125 (3.86)	198 (26.67)

CIS-R, Revised Clinical Interview Schedule; GAD, generalised anxiety disorder; OCD, obsessive-compulsive disorder. Phobias include agoraphobia, specific phobias and social phobia; participants who met criteria for both panic and agoraphobia were classified as having agoraphobia and not panic disorder in accordance with ICD-10 but not DSM-IV (American Psychiatric Association, 1994) criteria.

1. Actual number of participants. Percentages in comparison were weighted to account for the stratified random sampling and non-response.

2. All figures refer to 1-week prevalence of ICD-10 disorders.

3. Defined as a score on the CIS-R greater or equal to 12 and not meeting criteria for any other anxiety or depressive disorder (this entity represents the ICD-10 concept of 'mixed anxiety depression').

model adjustment for baseline CIS-R score reduced the association, which became non-significant (model 2, Table 3).

Table 4 presents the results for the cohort of cases of common mental disorder at baseline. In the crude analysis, all socio-economic indicators were associated in the expected direction with an increased risk of a time 2 episode ('persistent/recurrent' cases). However, after adjustment for socio-demographic variables these associations were reduced and became non-significant. Only participants without educational qualifications showed an increased risk of a time 2 episode, but adjustment for baseline severity of symptoms further reduced the association.

The analysis of the separate ICD-10 diagnostic categories is shown in Table 5. Generally the results are similar to the combined analysis with the exception of the financial difficulties variable. In depression, the reporting of financial difficulties at baseline was significantly associated with an increased risk of a time 2 episode for both cohorts but stronger for cases at baseline (persistent/recurrent cases).

DISCUSSION

We found little evidence that objective measures of socio-economic position were associated with an episode of common mental disorder at follow-up, after adjustment for confounding variables. From the indicators studied, we found significant associations before adjusting for baseline psychiatric symptoms, with a more subjective question on past financial difficulties for the cohort of non-cases and lower educational qualifications for the cohort of cases. These associations were reduced after adjustment. Separate analyses for specific diagnoses showed that in depression, financial difficulties were associated with an increased risk for both cohorts (but stronger for cases at baseline), even after adjustment for baseline psychiatric symptoms. The latter was the most consistent predictor of a time 2 episode for both cohorts.

Limitations of the study

Some limitations of the study should be considered. Participants were only assessed

at two time points 18 months apart and we do not have information concerning their mental health for the period between the two assessments. In addition, participants were not assessed for history of depression or anxiety disorders at baseline. For those who were not categorised as cases at baseline a new episode at follow-up could be either a first onset or a recurrence, depending on their psychiatric history and their status in the period between the two assessments. In addition, cases at baseline that were also cases at follow-up could be either chronic persistent cases (not recovered) or recurrences. It is also possible that some participants either developed or recovered from an episode during the 18-month period and then reverted to their original state by the end of the observation period. This imprecision will certainly introduce measurement bias and possibly selection bias if the duration of the episode is a confounding factor. These biases could influence the results in either direction. An alternative method would be to ask retrospectively about lifetime symptoms and symptoms during the 18-month follow-up period. However, retrospective reporting of psychiatric symptoms has been found to be unreliable and is also prone to recall bias (Simon & Gureje, 1999). There are examples from the Epidemiologic Catchment Area (ECA) study suggesting that even the lifetime recall of psychiatric history is not very reliable for depression (Thompson *et al*, 2004) or anxiety disorders (Nelson & Rice, 1997). It should be noted that this limitation is also present in most of the previous epidemiological studies concerning this issue. Gilman (2003) noted in his commentary on the meta-analysis by Lorant *et al* (2003) that of the included longitudinal studies only two out of five were 'true' incident studies and only one in four studies was designed specifically to assess 'persistence' of common mental disorders. In our own study, in order to avoid confusion, we chose not to use the terms 'onset' or 'persistence', but rather to describe exactly what we measured – that is, occurrence of a time 2 episode in the two cohorts of non-cases and cases of common mental disorders at baseline.

Although the total sample size was large, our statistical power was still limited and might have also contributed to our null findings, especially in the analysis of the cohort of cases. Finally, loss to follow-up was greatest among those in the lowest socio-economic groups, and although we

Table 3 Odds ratios for an episode of common mental disorder at the 18-month follow-up assessment in participants who were free from disease at baseline ($n=1656$)¹

Variable	n/N (%) ²	Crude ratios OR (95% CI)	Adjusted ratios	
			Model 1 ³ OR (95% CI)	Model 2 ⁴ OR (95% CI)
Socio-demographic variables				
Age, years				
16–24	16/154 (7.3)	1.00	1.00	1.00
25–34	45/327 (9.1)	1.28 (0.56–2.88)	1.57 (0.69–3.60)	1.95 (0.83–4.59)
35–44	38/366 (6.1)	0.83 (0.36–1.91)	1.08 (0.43–2.70)	1.29 (0.48–3.47)
45–54	43/321 (6.2)	0.84 (0.39–1.80)	1.15 (0.47–2.81)	1.24 (0.46–3.32)
55–64	25/241 (4.7)	0.63 (0.25–1.55)	0.63 (0.23–1.74)	0.73 (0.24–2.24)
65–74	17/247 (3.2)	0.43 (0.16–1.14)	0.26 (0.07–0.93)	0.37 (0.09–1.47)
Gender				
Male	72/745 (5.7)	1.00	1.00	1.00
Female	112/911 (6.9)	1.23 (0.80–1.89)	1.22 (0.75–2.01)	1.00 (0.59–1.67)
Employment status				
Full-time/part-time	113/1078 (5.8)	1.00	1.00	1.00
Economically inactive	66/523 (6.8)	1.20 (0.77–1.87)	1.89 (1.00–3.56)	1.88 (0.92–3.87)
Unemployed	4/49 (13.7)	2.60 (0.66–10.25)	1.96 (0.52–7.43)	2.70 (0.59–12.43)
Baseline CIS–R score		1.36 (1.27–1.44)		1.34 (1.25–1.43)
Socio-economic position variables				
Material standard of living score		1.27 (1.11–1.45)	1.20 (0.96–1.49)	1.13 (0.91–1.40)
Any financial difficulties				
No	114/1248 (5.03)	1.00	1.00	1.00
Yes	68/399 (11.84)	2.53 (1.59–4.04)	1.98 (1.22–3.21)	1.33 (0.79–2.23)
Educational qualifications				
Degree	38/424 (4.6)	1.00	1.00	1.00
A-level	24/220 (6.6)	1.47 (0.69–3.15)	1.49 (0.63–3.50)	1.44 (0.59–3.54)
GCSE or equivalent	66/586 (6.7)	1.49 (0.84–2.66)	1.50 (0.75–3.00)	1.49 (0.70–3.14)
No qualification	55/419 (7.5)	1.70 (0.92–3.15)	2.07 (0.96–4.48)	1.90 (0.83–4.31)
Social class				
I/II	66/638 (5.7)	1.00	1.00	1.00
III non-manual	47/380 (6.3)	1.12 (0.64–1.96)	0.73 (0.37–1.42)	0.78 (0.38–1.60)
III manual	31/307 (7.4)	1.32 (0.71–2.45)	0.88 (0.45–1.75)	0.92 (0.44–1.94)
IV/V	34/286 (6.6)	1.17 (0.64–2.15)	0.59 (0.27–1.28)	0.61 (0.27–1.40)

CIS–R, Revised Clinical Interview Schedule; GCSE, General Certificate of Secondary Education.

1. Because of missing values the total N used in the analysis was 1644. Missing values for the social class variable were included in the analysis but odds ratios for this category are not shown.

2. Actual number of participants with an episode of common mental disorder at follow-up; percentages in comparison are weighted to take into account the stratified sampling procedure and non-response.

3. Odds ratios adjusted for age, gender, marital status, type of family unit, employment status and other socio-economic position variables.

4. Model 1 plus adjustment for baseline CIS–R scores.

used weights to take into account non-response factors, our associations might have been biased towards the null value.

Comparison with other studies

There are a few longitudinal studies with which this one may be compared. The secondary analysis of the British Household Panel Survey (Weich & Lewis, 1998b) was also conducted in the UK. That study found

an association between an index of poverty and persistence, but not episode onset, at 12 months. It should be noted that the terms ‘persistence’ and ‘onset’ as used in that study were completely analogous to the analyses of the cohort of cases and non-cases presented here. That study also found that, independently of case status, participants not managing well financially at baseline (‘financial strain’) were more likely to report a new episode at

follow-up. In our study we did not find a significant association between our index of material standard of living and an episode of common mental disorder at follow-up, but our finding regarding financial difficulties is quite similar. Reasons for this discrepancy in our findings may include the longer interval of the follow-up (18 months) and the more detailed assessment of common mental disorders, based on a structured clinical interview. The British

Table 4 Odds ratios for an episode of common mental disorder at the 18-month follow-up assessment in participants classified as cases at baseline ($n=750$)¹

Variable	n/N (%) ²	Crude ratios OR (95% CI)	Adjusted ratios	
			Model 1 ³ OR (95% CI)	Model 2 ⁴ OR (95% CI)
Socio-demographic variables				
Age, years				
16–24	33/64 (46.0)	1.00	1.00	1.00
25–34	75/158 (47.1)	1.05 (0.53–2.08)	1.08 (0.46–2.54)	1.01 (0.41–2.44)
35–44	82/160 (50.5)	1.20 (0.63–2.29)	1.27 (0.54–2.99)	1.14 (0.46–2.82)
45–54	95/176 (55.3)	1.45 (0.76–2.78)	1.66 (0.66–4.19)	1.63 (0.63–4.23)
55–64	71/135 (51.4)	1.24 (0.64–2.42)	0.87 (0.33–2.31)	0.89 (0.32–2.49)
65–74	27/57 (47.5)	1.06 (0.48–2.37)	0.56 (0.19–1.60)	0.66 (0.22–1.96)
Gender				
Male	137/275 (49.1)	1.00	1.00	1.00
Female	246/475 (50.8)	1.07 (0.75–1.53)	1.20 (0.81–1.98)	1.22 (0.82–1.83)
Employment status				
Full-time/part-time	163/390 (41.4)	1.00	1.00	1.00
Economically inactive	201/322 (64.1)	2.53 (1.77–3.61)	2.65 (1.65–4.27)	2.45 (1.49–4.03)
Unemployed	16/31 (45.5)	1.18 (0.50–2.80)	0.87 (0.33–2.32)	0.91 (0.33–2.52)
Baseline CIS–R score		1.10 (1.07–1.13)		1.08 (1.05–1.12)
Socio-economic position variables				
Material standard of living score		1.20 (1.08–1.34)	1.05 (0.89–1.25)	1.00 (0.84–1.19)
Any financial difficulties				
No	185/406 (45.9)	1.00	1.00	1.00
Yes	191/332 (55.1)	1.45 (1.03–2.04)	1.25 (0.84–1.87)	1.26 (0.83–1.91)
Educational qualifications				
Degree	65/165 (38.9)	1.00	1.00	1.00
A-level	46/95 (47.6)	1.42 (0.74–2.72)	1.47 (0.77–2.79)	1.31 (0.66–2.58)
GCSE or equivalent	134/252 (51.7)	1.68 (1.08–2.61)	1.66 (0.99–2.77)	1.56 (0.92–2.65)
No qualification	135/231 (59.0)	2.26 (1.42–3.60)	1.87 (1.02–3.40)	1.70 (0.93–3.14)
Social class				
I/II	108/241 (44.4)	1.00	1.00	1.00
III non-manual	82/175 (45.0)	1.02 (0.64–1.64)	0.77 (0.45–1.30)	0.82 (0.48–1.40)
III manual	71/122 (57.6)	1.70 (1.06–2.74)	1.08 (0.61–1.89)	1.21 (0.67–2.20)
IV/V	109/186 (57.7)	1.71 (1.11–2.62)	0.87 (0.51–1.50)	0.86 (0.50–1.49)

CIS–R, Revised Clinical Interview Schedule; GCSE, General Certificate of Secondary Education.

1. Because of missing values the total N used in the analysis was 736. Missing values for the social class variable were included in the analysis but odds ratios for this category are not shown.

2. Actual number of participants with an episode of common mental disorder at follow-up; percentages in comparison are weighted to take into account the stratified sampling procedure and non-response.

3. Adjusted for age, gender, marital status, type of family unit, employment status and other socio-economic position variables.

4. Model 1 plus adjustment for baseline CIS–R scores.

Household Panel Survey used the 12-item General Health Questionnaire, a relatively simple self-reported instrument for the assessment of common mental disorders (Weich & Lewis, 1998a). In the USA, longitudinal analyses of the Alameda County study for onset of depression (Kaplan *et al*, 1987) and the ECA study for either onset (Bruce *et al*, 1991; Horwath *et al*, 1992; Bruce & Hoff, 1994; Eaton *et al*, 2001) or persistence of common mental

disorders (Sargeant *et al*, 1990) are also of interest. Regarding onset, Horwath *et al* (1992) and Eaton *et al* (2001) using the ECA data-set were unable to show a significant relationship between measures of socio-economic status and onset of depression, after adjustment for confounders. In contrast, in the Alameda County study the authors reported significant associations for education, income and presence of 'money problems' at baseline (Kaplan

et al, 1987). An analysis from the New Haven ECA site (Bruce *et al*, 1991) did find an association between poverty and major depression after adjustment for history of depression, but the results for other psychiatric disorders were not significant, even though the point estimates for the odds ratios were larger than 1.

When the analysis was restricted to first-onset depression (Bruce & Hoff, 1994) the authors reported a significant

Table 5 Odds ratios for an episode of depression, anxiety disorder or non-specific psychiatric morbidity by socio-economic position variables and baseline disease status

Variable	Major depression at time 2 ¹		Anxiety disorder at time 2 ¹		Non-specific psychiatric morbidity at time 2 ¹	
	Free of disease at time 1 (n=2273) ²	Cases at time 1 (n=133) ²	Free of disease at time 1 (n=2070) ²	Cases at time 1 (n=336) ²	Free of disease at time 1 (n=1981) ²	Cases at time 1 (n=425) ²
	Adjusted OR ³ (95% CI)	Adjusted OR ³ (95% CI)	Adjusted OR ³ (95% CI)	Adjusted OR ³ (95% CI)	Adjusted OR ³ (95% CI)	Adjusted OR ³ (95% CI)
Material standard of living score	1.13 (0.90–1.43)	1.09 (0.75–1.61)	1.24 (0.96–1.59)	0.97 (0.73–1.28)	0.95 (0.79–1.15)	0.99 (0.77–1.26)
Any financial difficulties						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	2.05 (1.05–3.98)	4.20 (1.19–14.80)	1.21 (0.65–2.26)	1.81 (0.96–3.39)	1.46 (0.92–2.34)	0.70 (0.41–1.20)
Educational qualifications						
Degree	1.00	1.00	1.00	1.00	1.00	1.00
A-level	2.45 (0.59–10.17)	2.09 (0.21–20.90)	1.31 (0.45–3.79)	1.67 (0.55–5.10)	0.82 (0.36–1.82)	2.01 (0.79–5.09)
GCSE or equivalent	0.86 (0.32–2.28)	3.11 (0.29–32.93)	1.13 (0.51–2.53)	1.54 (0.56–4.23)	1.30 (0.68–2.48)	2.60 (1.28–5.29)
No qualification	2.09 (0.69–6.35)	3.70 (0.28–48.46)	0.75 (0.30–1.85)	1.11 (0.39–3.18)	1.82 (0.98–3.41)	2.55 (0.96–6.76)
Social class						
I/II	1.00	1.00	1.00	1.00	1.00	1.00
III non-manual	0.25 (0.08–0.82)	0.06 (0.005–0.72)	0.73 (0.37–1.44)	1.06 (0.44–2.57)	1.36 (0.71–2.62)	0.63 (0.31–1.27)
III manual	1.29 (0.48–3.49)	0.74 (0.073–7.61)	1.29 (0.59–2.84)	1.53 (0.54–4.32)	0.83 (0.44–1.58)	0.83 (0.39–1.78)
IV/V	0.72 (0.21–2.40)	0.05 (0.007–0.42)	1.09 (0.48–2.47)	0.88 (0.35–2.17)	0.75 (0.40–1.41)	0.50 (0.20–1.24)

GCSE, General Certificate of Secondary Education.

1. Diagnoses according to ICD-10 criteria; non-specific psychiatric morbidity is defined as a CIS-R score ≥ 12 and not meeting criteria for any other anxiety or depressive disorder (this entity represents the ICD-10 concept of 'mixed anxiety depression').

2. Owing to missing values the actual numbers of participants used in the analysis were 2252 and 119 for depression, 2051 and 318 for anxiety disorders, 1961 and 419 for non-specific morbidity for time 1 (baseline) and time 2 (18-month follow-up) respectively; missing values for the social class variable have been included in the analysis but the odds ratios for this category are not shown.

3. Odds ratios adjusted for age, gender, marital status, type of family unit, employment status, baseline CIS-R score and other socio-economic position variables (model 2 of previous tables).

association between poverty and first-onset major depression, but they presented odds ratios adjusted for age and gender only. Regarding persistence of depression, Sargeant *et al* (1990) using the ECA data-set did not find any significant association with socio-economic status score, lower education or persistence, after adjustment for baseline severity of symptoms. Data from the Stirling County study in Canada showed that there was a trend for low socio-economic status to be associated with both onset and persistence of depression or anxiety, but these findings were not significant after adjustment for age and gender (Murphy *et al*, 1991). A meta-analysis of longitudinal studies found a significant association between socio-economic indicators and both onset and persistence, although the effect for persistence was larger (Lorant *et al*, 2003). However, it is worth noting that this meta-analysis was heavily influenced by the results of the British Household Panel Survey (Weich &

Lewis, 1998b), which had the largest weight on both onset and persistence. In addition, some of the papers included in the meta-analysis did not adjust for potential confounders that made an important difference in our own study. In our unadjusted analysis of the cohort of cases (the 'persistence' cohort) we found significant associations between all measures of socio-economic position and a time 2 episode of common mental disorder, but these disappeared when we adjusted for the other variables in the model.

In our main analysis we found significant associations with past financial difficulties (in the cohort of non-cases) and lower education (in the cohort of cases) only before adjustment for baseline CIS-R scores. However, it should be noted that if baseline psychiatric morbidity is on the causal pathway between low socio-economic position and onset or persistence of common mental disorders, this could constitute an example of overadjustment.

This is the reason behind our choice of presenting the results before and after adjustment for CIS-R scores.

The question on financial difficulties is more subjective in nature and reflects the individuals' way of life. People in higher-income groups may, for example, experience financial difficulties owing to overspending or inappropriately raising their standard of living. In our main analysis there was evidence that participants categorised as non-cases at baseline experiencing financial difficulties had an increased risk of a time 2 episode, even though the association became non-significant after adjustment for CIS-R scores. Using depression as our dependent variable, the association was significant in the full model and it was also observed in the cohort of cases. These findings are consistent with research suggesting that subjective measures of material standard of living may be equally important in the relationship between socio-economic position and common mental disorders,

compared with the more objective measures of income or wealth (Kaplan *et al*, 1987; Lewis *et al*, 1998).

Our data also show that those in the economically inactive category had a worse prognosis than those working full-time or part-time (see Table 4). This category included all those who reported that they were unable to work owing to long-term illness or disability. Most of these people were deriving income from state benefits (75% *v.* 11% of those working full- or part-time). Separating these from the other economically inactive participants (students, homemakers) increased further the association with persistence of common mental disorders (OR 4.43, 95% CI 2.54–7.70). Participants with long-term illness or disability were also more likely to report a new onset of disorder (OR=2.56, 95% CI 1.10–5.94). An analogous finding was reported by the ECA Baltimore follow-up study (Eaton *et al*, 2001); in that analysis, although objective measures of socio-economic position were not associated with onset of depression, a higher psychological demand in the work environment and financial dependence on state aid were found to be independently associated.

Baseline CIS-R scores were strongly associated with a time 2 episode for both cohorts of cases and non-cases. This is consistent with previous research (Sargeant *et al*, 1990; Horwath *et al*, 1992) and presumably reflects the chronic nature of many common mental disorders. These findings emphasise the need to use methods for prevention and treatment of common mental disorders similar to those used in other chronic diseases such as diabetes or coronary heart disease (Lloyd *et al*, 1996).

Is there a link between low socio-economic position and common mental disorders? Pearlin *et al* (1981) have argued that low socio-economic status can be considered as an example of a chronic stressor that increases the exposure to acute stressors and limits the psychosocial resources for coping. Other possible mechanisms may include less perceived social support (Wade & Kendler, 2000), lower control over one's environment (Baum *et al*, 1993) and unfavourable social comparison with others (Ahrens & Alloy, 1997). In addition to these indirect effects, low socio-economic position may have direct effects on mental health. Link & Phelan (2002) have proposed that low socio-economic status can be viewed as a 'fundamental cause' of disease, over and above its

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effect on mediating mechanisms. What this and other studies add is that the effects on mental health of objective measures of socio-economic position, such as income or occupational social class, may have been overestimated. Further research in more subjective measures of socio-economic position is needed in order to improve our understanding of the mechanisms by which socio-economic circumstances lead to depression and anxiety, if we are to devise effective ways of preventing and treating these disorders.

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