Disability, gender and the British labour market

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ABSTRACT

Using UK LFS data, we examine the impact of disability on labour market outcomes by gender since the Disability Discrimination Act. Substantial differences in employment incidence and earnings continue to exist, especially for those with mental health problems. Distinguishing between work-limiting and non-work-limiting disability, the unobserved productivity effect of disability can be separated from discrimination. Limited evidence of wage discrimination against the disabled exists, but the 'penalty' for work-limiting disability, while falling for men, has increased for women. The improvement for disabled males is largely 'unexplained', possibly reflecting the impact of the legislation; this is not the case for females.

JEL Classification: I1, J2, J3

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1. Introduction.

The economic analysis of disabled workers within the labour market has been relatively neglected in the UK, especially given the numerical size of this group.[1] Using the 2001 Labour Force Survey (LFS) Smith and Twomey (2002) note that nearly one in five people of working age had a current long term disability in the UK; this amounts to some 3.7 million men and 3.4 million women. As the European Foundation (2003) notes, although cultural factors may operate both across and within countries to influence the incidence of reported disability, only Finland has a higher percentage of the working age population (defined as aged 16-64 years according to the European Community Household Panel (ECHP)) reporting chronic illness or disability than the UK.[2] The contrast in labour market outcomes for disabled and non-disabled persons in the UK is stark: the employment rate for the disabled is just 48%, compared to a rate of 81% for the non-disabled, while for those disabled people in employment, average earnings are substantially lower than for their non-disabled counterparts.

The above figures are especially striking when considered in the context of legislative and other reforms over the last few years aimed at securing improvements in the labour market position of disabled individuals. The major legal change in this regard was the passing of the Disability Discrimination Act (DDA) in 1995, which was designed to protect the disabled against discrimination and to facilitate and enhance their access to employment by imposing obligations on employers (with 15 or more employees) to make reasonable adjustment to their premises and/or employment arrangements.[3] In addition, a Disability Rights Commission provides advice

[1] This contrasts sharply with the US where there has been a substantial increase in publication on such issues following the passing of the Americans with Disabilities Act (ADA) in 1990.
[2] Within the UK the average rate was 18.8% in 2000, but this varied between 15.8% in the South East and 23.9% in the North East. The differential between regional rates is relatively higher among older persons.
[3] The 1997 Treaty of Amsterdam extended the coverage of Community Law to cover, *inter alia*, disabilities, and an EU directive of November 2000 prohibits any direct or indirect discrimination based on disability with respect to

and information, supports disabled persons in securing their rights under the DDA, and campaigns on behalf of this group. The Government has also improved incentives to work via the tax and benefit system and more particularly through the Disabled Person's Tax Credit, while the New Deal for Disabled People (NDPP) introduced in July 2001 further attempts to help those out of employment to get back into work. This last policy measure is a voluntary programme whereby disabled people have access to a network of Job Brokers whose role is essentially to provide advice about the local labour market and to support individuals in finding and retaining work.[4]

A key issue for policymakers is to determine the extent to which such reforms have achieved their objectives. However, estimation of the impact of legislation and other policy measures in this area is hazardous for a number of reasons. In this regard work in the US is more advanced, and a number of studies has attempted to estimate the employment effects of the Americans with Disabilities Act (ADA). Thus, DeLeire (2000) found that on average over the post ADA period, employment of men with disabilities was 7.2% lower than before the Act was passed. Similar results were obtained by Acemoglu and Angrist (2001), who point out that although the number of disability transfer payments went up, this cannot on its own explain the decline in employment. Consistent with ADA being the explanation, the impact was greater in

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employment and occupation. This required the UK to extend the coverage of the DDA to cover all employers, including those employing fourteen or fewer workers, as from October, 2004.

[4] Britain had had some form of means tested benefit for adults with children on low earnings who worked more than a certain number of hours per week since 1971. In October 1999 a more generous tax credit was introduced. However, at the same time out of work benefits for families with one or more children aged under 11 were introduced, so that the overall impact on labour force participation was unclear. Leigh (2004) reports that the reform also reduced the fraction of people who said they had a serious health problem or that a health problem prevented them from working by about 1%, and for all affected groups, raised relative employment rates by 1%. Hours and relative earnings also increased. The Disabled Persons tax credit, also means tested, required that disabled people were in receipt of various types of disability benefit in the previous 26 weeks to qualify and working 16 hours or more a week. Together with the New Deal for Disabled People, this should have increased the willingness to seek work by increasing the total benefits from working and reducing reservation wages. The complexity of these arrangements means, however, that it is not feasible to attempt to identify their effects in this study, save to say that they may to some degree have offset any negative effects of the DDA as outlined in the US literature.

larger firms (smaller firms being exempt) and in States with more ADA-related discrimination charges. The implication of these results is that the legislation reduced the demand for disabled workers by raising the costs of employing such workers by more than the increase in demand brought about by any reduction in discrimination. However, these results have been questioned on the grounds that the work disability measure used may not accurately reflect coverage under the ADA. Legislation may, by removing the stigma of disability, encourage more individuals to report a disability. Further, some who previously reported a disability prior to the legislation may not do so subsequent to its introduction if improvements to the workplace mean they are no longer limited in their work. As Kruse and Schur (2003) conclude, the analysis of the employment effects of disability legislation is confounded by changes in the composition of those reporting disabilities, the role of disability income and the relative effects of business cycles on workers with and without disabilities. Thus, Beegle and Stock (2003) make use of the fact that disability discrimination laws vary widely across States with respect to their coverage of physical and mental disabilities to use an experimental framework that generates treatment and comparison groups. While they find negative effects of the laws on the relative earnings of the disabled, once they have controlled for pre-existing employment trends among the disabled and non-disabled, there is no such effect on relative employment rates of the disabled. Similarly, Hotchkiss (2004) notes that previous studies have failed to control for selection into the labour market. When this first stage selection process is controlled for, the predicted unconditional employment probability for a disabled person has actually increased since the ADA legislation. Further, there is evidence that non-participant welfare recipients have changed their identification in order to move off welfare payments and into disability programmes. She suggests that condemnation of ADA should focus on the possibility that by lowering wages of

the disabled, it has caused some of them to drop out of the labour market, a feature which is examined for Britain in this paper.

A further complicating factor, which has received growing attention in the literature is 'justification bias' or the endogeneity of self-assessed health measures. In particular, disability may be a socially acceptable and convenient rationalisation of absence from the labour market. However, most studies focus on self-reported health status rather than objective measures of disability, and there is a suggestion that self-reported records of specific illnesses may be less prone to this form of bias, though this has been questioned by Baker *et al*. (2004). The empirical evidence on justification bias is mixed. Kreider (1999) suggested that over-reporting of health related work limitations was particularly prevalent among non-working women, high school drop-outs, non-whites and former blue-collar workers in the USA. Such biases will lead to over-estimates of the effects of limitations on non-work activity and under-estimates of the effect of income on such activity. Kreider and Pepper (2002), using data from the Health and Retirement Study, confirmed the fact that models estimated on the assumption of fully accurate reporting led to biased inferences with non-workers tending to over-report disabilities. Yet Campolieti (2002), using information on specific health conditions as instruments on Canadian data found that self-reported measures tended to under-estimate the effect of disability status on labour force decisions and Benitez-Silva *et al*. (2003) using the same Health and Retirement Study, but examining a sub-sample of disability applicants, found that such individuals did not on average exaggerate their disability status. Finally, Au *et al*. (2004), again using Canadian data, found some evidence of justification bias when using self-assessed health, but these provided similar estimates of employment effects as objective measures or a 'purged' health measure. Given the absence of fully objective measures in the LFS, our approach to this problem is two-fold. First,

we model employment and earnings separately for men and women, with the likelihood that misreporting may affect both groups equally, and second, we also model the effects of particular types of disability on employment and earnings. These specific health measures, while also self-reported, as noted above, are perhaps likely to be less severely contaminated by such biases.

In the UK, no comparable studies exist that attempt to examine the impact of the DDA. Indeed, to our knowledge there are very few extant economic studies of the labour market outcomes of the disabled. Blackaby *et al*. (1999) is a comprehensive report prepared for the then Department for Education and Employment (DfEE) using data from the 1991 Census, 1992-4 Quarterly LFS data and the General Household Survey (GHS). Irrespective of data source, the findings indicate that the unemployment probabilities of the disabled/those with long-term health problems are higher than for the non-disabled/those without long-term health problems, while their earnings are lower. Differences in characteristics (productivity) account for a maximum of around half of the differences, the employment differential being perceived as the more substantial (confirming the figures above).

The only UK study published in an economics journal to date however, is that by Kidd *et al*. (2000) which uses data from the 1996 LFS, but restricts the analysis to males only.[5] These authors again find that human capital/productivity characteristics differences between the disabled and non-disabled explain around 50% of the wage and participation rate differentials between the two groups. They therefore conclude that, notwithstanding difficulties in interpretation, the size of the residual or unexplained element of the difference (in wages) suggests that it 'may, in part, be addressed by the implementation of the 1995 Disability Act' (2000: 979).

[5] Contoyannis and Rice (2001) do however examine the related issue of health on earnings for both men and women.

The present paper in part adopts the approach in Kidd *et al*., but using more recent data from the LFS, and with a number of important additions/differences. These novel features are set out in more detail below, but primarily include examining the effects by gender, superior handling of potential unobserved productivity differences between the disabled and non-disabled (and hence of any discriminatory behaviour by employers), and estimation at two points in time so as to explore the efficacy of the DDA.

1.1 Gender

A particular focus in this paper is on gender differences in disability effects in the labour market. Since the relative position of women in the labour market in general is inferior to that of men, at least in terms of earnings, it is clearly of interest to ascertain whether disabled women are similarly disadvantaged relative to disabled men.[6] It should be noted, for instance, that long-term illness affects manual workers disproportionately and men are heavily concentrated in these jobs relative to women, though it does not necessarily follow that disability has a greater impact on men than on women. Further, comparing men and women overcomes many of the difficulties outlined above. The disability rates for men and women of working age are very similar and there is no clear evidence of differential reporting bias according to gender. Given that the results in Kidd *et al*. (2000) were restricted to males only, we believe extending the analysis to consider both sexes constitutes an important and original contribution to the UK literature, although such an analysis has been undertaken for the US (see Baldwin and Johnson, 1995).

[6] Haveman *et al*. (2000) find that disabled men fare somewhat better than disabled women when comparing the size of family income. Stapleton and Burkhauser (2003) using the US Current Population Survey found that mean household income of working-age men without disabilities increased by 12.6% between 1989, a peak year in the 1980s business cycle, and 2000, a peak year in the 1990s business cycle, compared to a fall of 2.9% over the same period for men with disabilities. The corresponding figures for women increased by 12.6% and 5.6% respectively.

1.2 Productivity and discrimination

A second departure from Kidd *et al*., who assume there are no unobserved differences in productivity between the disabled and non-disabled is our use of an approach previously adopted by DeLeire (2001) on the US Survey of Income and Program Participation over the period 1984-93. He argues that the change in the unexplained component of the wage decomposition between these two dates should say something about how discrimination has changed over the period. Further, the sample is split into three groups – the non-disabled, the disabled who report that their productivity at work is unaffected by their disability, and the disabled who report that their disability is work-limiting (i.e. affects the type and amount of work that the individual can do).[7] Assuming that those who report no work limitations do not have lower productivity as a result of their health impairment relative to the non-disabled, we can interpret the unexplained residual in a Oaxaca-type decomposition in their case as an estimate of discrimination. Further, if the degree of discrimination is assumed to be the same for both groups of the disabled, the unexplained residual of the work-limited group of disabled (less the measure of discrimination for the non-work-limited disabled group) may be considered an estimate of the lower productivity of the work-limited disabled relative to the non-disabled that is not captured by the measured characteristics included in the empirical model. In DeLeire's case, using this procedure, only 3.7 percentage points of the earnings gap in 1984 was found to be the result of discrimination and the amount of discrimination did not change significantly between 1984 and 1993. However, the negative effects of poor health on the earnings of the disabled fell substantially, possibly because

[7] There are certain differences in the types of disability which affect the two disabled groups. In 1997 (2003), 44.27% (38.90%) of those with work limiting disabilities report main health problems relating to arms, hands, legs or feet, or back or neck compared to only 21.38% (18.88%) for the non-work limited disabled, while only 21.78% (18.84%) of those a work limiting disability reported chest, breathing problems or heart, blood pressure, circulation problems compared to 39.85% (41.58%) in the case of the non-work limited disabled. The second group of disability types may be less visible to the employer without the use of medical tests (on the incidence of which we have no information); there is little difference in the percentages affected by more visible forms of disability among the two disabled groups.

of the positive effects of disability legislation in requiring employers to provide reasonable accommodation for disabled employees.

1.3 Post-DDA impact over time

The third major difference between the present paper and Kidd *et al*. exploits the availability of more recent data to consider the impact of the DDA. It should however, be noted that a formal evaluation of the impact of the DDA using the results of Kidd *et al*. as a base or benchmark against which to gauge progress is problematic. This is in part due to the fact that similar problems apply to those experienced by US researchers examining the ADA. However, these difficulties are compounded in the UK context by a change in disability questions in the LFS. More specifically, until the Winter of 1996 individuals were asked:

(i) if they had health problems which would affect any kind of paid work they might do; and

(ii) if the health problem would be expected to last more than a year.

From Spring 1997, the order in which these questions were asked was reversed, and an additional question was asked about the amount of paid work the disabled can do. As Cousins *et al*. (1998) note, this simple change identified 24% fewer respondents in the UK reporting a long-term disability which affected the kind of work they might do, and of those it did identify, a greater proportion were economically inactive.[8] This makes any attempt to estimate the

[8] In the Winter of 1996 15,150 (16.93% of the sample) said they had health problems that affected the kind of paid work they might do. This is a smaller number than those who answered the initial question in Spring 1997, namely that they had a health problem lasting more than one year, which numbered 15,947 (or 18.97% of the sample). In 1996, 902 (6.03% of the sample) answering the question on health problems lasting more than one year (yes/no) had a health problem lasting less than one year, and these would not be included from 1997. However, from 1997 the change in the order of questions means that we can identify those disabled who were not affected by the amount of work they could do, though they were affected by the nature of work. These amount to 1,950 (or 18.3% of those whose health problem affected the kind of work they could do) who previously could not have been counted as work-limited disabled.

employment effects of the DDA on the basis of a before and after study using the LFS hazardous.[9]

In our case we make use of the above distinction between work-limiting and non-work-limiting disability using the LFS between Spring 1997 and Winter 2003/4 – a period of over six years. Fortuitously, the start period is only a few months after the 1995 Disability Discrimination Act came into operation (on the 2nd December 1996). We are unable to adopt a before and after approach due to the data limitations previously discussed, so that any immediate impact of the legislation may be missed. However, as Hotchkiss (2004) notes, the question of when the legislation will have its strongest impact is debatable. She defines the post-legislation period as the first full year of implementation of ADA rather than the date of its enactment and we adopt a similar approach here, comparing two points of time in the post-DDA period, it being unlikely that the full effects of the legislation would be identified prior to this.

A final feature of the paper that should be noted at the outset is that while most studies of discrimination focus on between-group differences in economic outcomes, we also identify within-group differences. Disability varies both in type and intensity, leading to the possibility of omitted variable bias when differences in functional capabilities are excluded. The problem is that it is generally not possible to incorporate these into the analysis of between group differences, since the non-disabled, by definition, do not possess such disabilities. However, we can compare the case of disabled men and women, including functional limitations in both equations (see Salkever and Domino, 2000).[10] To anticipate our results somewhat, it is clear that

[9] Seasonal differences in the LFS mean that it is not appropriate to limit the analysis to a single quarter. The LFS recorded 16% more disabled in Winter 1997 than in Spring 1997. Hence the ONS suggests data for Summer, Autumn and Winter are more reliable and imply a decline of only 10% in the number of disabled compared to the results from the earlier question format.

[10] However, their results were rather mixed. Their employment probit results suggest that persons with severe disabilities are more likely to be employed, rather than less, although their wage regressions suggest that those with severe disabilities do earn less.

significant differences do exist between types of disability. This is most notable for individuals with mental health problems, whose labour market position appears especially adversely affected. This has potentially important implications for the design of policy, which has hitherto largely focused on physical impairment and adaptation.

The remainder of the paper is structured as follows. In Section 2 we set out the empirical methodology employed, followed in Section 3 by a brief description of the data. Results appear in Section 4, together with a discussion of the implications deriving from these, while conclusions follow in Section 5.

2. Methodology.

The standard labour economics model assumes that individuals select that combination of consumption and hours of work which maximises their utility, subject to budget and time constraints. Health may be incorporated into the standard model, either through the budget constraint (via a lower wage offer), the time constraint (via more absences lowering time available for work) or through the utility function itself if poor health reduces utility (see Ettner, 2000).

We follow the traditional labour force participation model in assuming that an individual decides upon whether or not to enter the labour market on the basis of a comparison between the employer's wage offer and his or her reservation wage. Low employment rates[11] could be due in part to high reservation wages associated with certain types of disability as a consequence of disability income transfers and the extra demands on time and energy required to participate in

[11] It should be noted that our definition of participation in the empirical section is based on the observation of a positive wage for a particular individual, and therefore strictly speaking relates to employment. This clearly understates the true level of participation to the extent that it treats the unemployed as non-participants and excludes those in employment with missing wage data (see below).

the labour force. Low employment rates might also be due to low market wage rates offered to the disabled as a consequence of lower levels of productivity and/or employer discrimination (Kruse and Schur, 2003).

There are three types of individual for each gender (results are estimated separately for men and women; a distinction which is suppressed in the notation for simplicity). The disabled are represented by D_1 (work-limited) and D_2 (non-work-limited) and the non-disabled by N, giving six groups in total. For each of these types the wage offer equation is given by:

$$W_{ij}^{O} = \beta_j X_{ij} + v_{ij} \quad (j = D_1, D_2, N) \tag{1}$$

where W_{ij}^{O} denotes the logarithm of the (offer) wage, X_{ij} is a vector of productivity related characteristics for individual i of type j and β_j the associated rates of return, making the normal assumptions of the human capital model. The reservation wage is given by:

$$W_{ij}^{R} = \alpha_j Z_{ij} + \varepsilon_{ij} \quad (j = D_1, D_2, N) \tag{2}$$

where the vector Z incorporates the conventional human capital variables, with the addition of factors influencing the value of time (such as the number of dependent children). We do not directly observe the reservation wage, which is a latent variable, but rather the indicator variable I, where $I = 1$ if $W_{ij}^{O} > W_{ij}^{R}$ and 0 otherwise. Thus, the probability that an individual works is:

$$P_r\left[W_{ij}^{O} - W_{ij}^{r} > 0\right] = P_r\left[\beta_j X_{ij} - \alpha_j Z_{ij} > \varepsilon_{ij} - v_{ij}\right] \tag{3}$$

Assuming that v_{ij} and ε_{ij} are normally distributed, the labour force participation (employment) equation may be estimated by a probit specification.

In estimating the wage equation (1), it is important to correct for sample selection, given that the disabled in particular are unlikely to be a random sub-set of the population as a whole. Indeed, if wage discrimination against disabled workers is substantial and leads to those subject

to significant discrimination exiting from the labour force, the estimate of true wage discrimination would be below its true level. Thus, we utilise a Heckman two-stage procedure in which the probit estimates are used to derive the inverse Mills ratio, which is used as an additional regressor in the wage equation.

In estimating the size of the discriminatory wage differential which may exist between disabled and non-disabled employees, we follow earlier studies by Lambrinos (1981) and Baldwin and Johnson (1994, 2000), based on a technique developed by Reimers (1983). The difference in wage offers between non-disabled (*N*) and disabled (*D*) employees can be decomposed as:

$$\overline{W}_N - \overline{W}_D - (c_N\overline{\lambda}_N - c_D\overline{\lambda}_D) = (\overline{X}_N - \overline{X}_D)\ \left[\Omega\hat{\beta}_N + (1-\Omega)\hat{\beta}_D\right]$$

$$+\left[\overline{X}_N(1-\Omega) - \overline{X}_D\Omega\right](\hat{\beta}_N - \hat{\beta}_D) \qquad (D=D_1 \text{ or } D_2) \tag{4}$$

The left-hand side of equation (4) then represents the difference in mean wage offers between non-disabled and disabled employees. The first term on the right-hand side represents that part of the difference in wage offers which is attributable to differences in productivity, while the second term represents that part of the wage difference which is unexplained. The latter is conventionally interpreted as discrimination, but here we distinguish between non-work limited and work-limited disabled to control for unobserved productivity differences, as well as including types of disability to capture specific health problem effects. A matrix Ω represents the relationship between the observed wage structure and the non-discriminatory norm. Its diagonal elements take values ranging from zero to one depending on which group is the frame of reference given the typical index number problem (see Oaxaca and Ransom, 1994). We provide results using the disabled as the base (0), the non-disabled (1), taking the mean of these two results (0.5) (Reimers, 1983), taking ratios given by the shares of the non-disabled and

disabled in the working population (Cotton, 1988), and finally the figure obtained from a pooled regression (*) (Neumark, 1988). In addition, we report decompositions between men and women for each of the three disability categories using an analogous method.

Further, given that we estimate our wage equations at two points in time, we also perform time-wise decompositions for each of our six groups, so as to examine the contributions of (changes in) characteristics and coefficients to wage offer growth for each group over the period 1997 to 2003, i.e.

$$\overline{W}_{2003} - \overline{W}_{1997} - (c_{2003}\overline{\lambda}_{2003} - c_{1997}\overline{\lambda}_{1997}) = (\overline{X}_{2003} - \overline{X}_{1997}) \left[\Omega\hat{\beta}_{2003} + (1-\Omega)\hat{\beta}_{1997}\right] + \left[\overline{X}_{2003}(1-\Omega) - \overline{X}_{1997}\Omega\right](\hat{\beta}_{2003} - \hat{\beta}_{1997}) \quad (5)$$

Finally, it has been argued that health and employment may be endogenous. Thus, in the case of mental health disability, employment may have a positive effect by increasing opportunities for social networking and role satisfaction, but also a negative effect if it increases occupational stress. In the case of physical health, positive effects may arise from the ability of higher income from work to be invested in health improvements, but negative effects from occupational hazards or stress from work overload. In such cases health may be correlated, either positively or negatively with the error term in the participation equations. Such evidence has been found by Ettner (2000) using 1993 US data. Two-thirds of her sample reported either positive or negative effects (more cases being positive than negative). However, using a two-step instrumental variable approach she finds that the effects of health on labour market outcomes are not particularly sensitive to reverse causality. For this reason, and because of the difficulty of finding appropriate instruments in our data set, no attempt is made here to deal with potential problems of endogeneity.

3. Data.

We utilise individuals in waves 1 or 5 from each of the four quarters of the LFS in 1997 and 2003, so as to exclude repeated observations on the same individual (by design individuals remain in the survey for five consecutive quarters). The work-limited disabled are defined as individuals who have a self-reported long-term illness (12 months or more) which limits the type or amount of work they can do, the remaining disabled being defined as non-work-limited and all other individuals classified as non-disabled. As noted earlier, labour market activity equals one if the individual is an employee with a positive wage, and otherwise is zero.[12]

As Baldwin and Johnson note, in theory all variables in the wage equation should also be included in the employment equation, but clearly some of these variables will not be observed for those not in employment. This could adversely influence the correction for selectivity bias in our equation. Identification is obtained by including a variable for the number of children in the household in the employment equation if the respondent is the head of household or their spouse (zero otherwise). In addition to this, we also incorporate a dummy indicating the presence of a labour market income earner in the household in the participation equation. Finally, we use experience and its square in the wage equation, but linear and quadratic terms in age in the employment equation. Qualifications dummies and regional dummies, together with ethnic origin, type of household tenure and number of health problems appear in both employment and wage equations. The latter also includes occupational and industry dummies, the number of days off sick in the reference week, a small establishment dummy, a public sector dummy, a part-time dummy and tenure variables. The hourly pay variable is based on usual weekly pay divided by usual hours, with a dummy variable included also for the amount of usual overtime. In addition

[12] Individuals who are self-employed, on a government training scheme, or who have missing information with regard to their hourly wage or other key variables are excluded from the estimation sample.

to separate estimation by reported disability status, all these equations are estimated separately for men and women, thereby allowing for the possibility that some of the independent variables may have gender-specific effects.

In addition, we estimate employment and wage equations for the disabled only augmented by five health type dummies derived from the 17 main health problems identified in the LFS. It was necessary to merge some of these for estimation purposes because of problems of small cell sizes. It should be noted that in 2003, only just under a quarter of those reporting a health problem claim sickness or disability benefit,[13] but this figure is higher for men (26%) than for women (21%).[14] There is also substantial variation in the percentage of those with different types of health problem claiming sickness/disability benefits, ranging from 3.2% in the case of skin conditions/allergies to 62.1% in the case of mental illness/phobia. Similar variability occurs in relation to ILO unemployment (defined according to the International Labour Office as those actively seeking work in the previous four weeks) and inactivity by reported health problem (cf. disability). The former ranges from 1.3% in the case of 'other' progressive illness to 8.7% in the case of learning difficulties and the latter from 20.1% in the case of skin conditions/allergies to 80.1% in the case of mental illness/phobia. Therefore there is a very wide variation in the extent to which various types of health problem hamper job prospects, with mental illness having the most severe effects. This last statistic confirms the particular difficulties faced by persons with mental illness identified in previous research (see Meager *et al*., 1998; Bunt *et al*., 2001).

[13] These data are based on the estimation sample augmented by those in employment with missing wage information (whose exclusion would otherwise inflate the reported figures).
[14] The corresponding figures for disabled persons are 44%, 49% and 39% for all, males and females respectively.

4. Results.

As shown in Fig. 1, the percentage recorded as non-disabled in the LFS over the period 1997-2004 has fallen by 6 or 7 percentage points from a starting value of around 80% for both men and women. The incidence of work-limiting disability has increased only marginally over the period, with the percentages for men and women again being relatively close. Significantly, however, the number of persons reporting themselves as non-work-limited disabled grew substantially between the two dates, from around 7% to nearly 12% for both men and women, which is perhaps indicative of the liberating impact of the legislation in terms of reporting disability for this group. It should be noted that our sample of the latter in absolute terms is much larger than in the DeLeire study for the US.

<Fig. 1 about here>

In terms of employment rates, this was 26.69% (30.96%) for work-limited disabled men in 1997 (2003), compared to 79.41% (78.34%) for non-disabled men. The non-work-limited disabled men's employment rate in 1997 (2003) was 81.24% (80.66%). For women the corresponding figures for work-limited disabled were 27.43% (31.22%) and for non-work limited disabled 72.36% (70.90%) respectively, compared to 67.88% (68.52%) for non-disabled women. Thus, for both men and women, employment rates for the work-limited disabled have improved relative to those of the other two groups, which is an indication of a possible, positive effect from the DDA.

Turning next to wages, in 1997 the hourly earnings of those whose disability was work-limiting were 86.1% of those of the non-disabled, whereas earnings for the non-work-limited disabled were 100.65% of those of the non-disabled. By 2003 these figures were 86.0% and 98.2% respectively (the time profile of earnings for each of the groups is presented in Fig. 2).

There is no *prima facie* evidence therefore, at least on the basis of these data, that the relative position of the disabled has changed over the six years since the introduction of the DDA.

<Fig. 2 about here>

The means of the variables used in the regression analysis are presented in Table 1, and several important differences among the sub-groups are worthy of note. In large part these conform to expectations. Thus, for both men and women, disabled persons, particularly those who are work-limited, are on average, less well qualified than their non-disabled counterparts, with the disparity being most acute for those with the higher qualifications such as degrees. Disabled persons are also typically older (reflecting the fact that many disabilities exhibit age-related onset), and for this reason, also more likely to own their own home; they are also however, more likely to be in public housing. Both male and female disabled groups are also, on average, less likely to be in a household where another individual has a source of earned income (for a discussion of which, see below), suggesting that they cannot rely on this as a means to ameliorate their own disadvantage in the labour market. In every case the differences are more marked between the work-limited disabled and the non-disabled (cf. the non-work-limited disabled).

For those who are in employment, there are also substantial differences between the work-limited disabled and the non-disabled, and also between males and females. These differences are most marked in the proportions working in certain occupational groups, the public sector and small firms. Men typically work more overtime hours than women, and the non-disabled more than the disabled; this is inversely correlated with the proportions working part-time, as would be expected. Finally, it is especially interesting to note that disabled males and females have longer average tenure than their corresponding non-disabled comparator group.

4.1 Employment participation

The employment participation probit estimates are presented in Table 2 for men and Table 3 for women respectively. As can be seen, for the sake of parsimony, we report a full set of coefficient estimates for 2003 only; results for 1997 are broadly similar, and are available on request. In all cases, Likelihood Ratio tests unambiguously reject the null hypothesis that the coefficients in each regression (both reported and unreported) are jointly insignificant.

Turning to the coefficient estimates presented, most findings are in accordance with expectations. Thus, the results show that both men and women with educational qualifications are significantly more likely to be in employment than those without any qualifications; a finding that applies for both categories of the disabled as well as the non-disabled. However, the marginal effect of each qualification is stronger for the work-limited disabled, indicating the particular importance of obtaining qualifications among this group.[15] There are, in addition, strong age effects, with positive and negative signs on the linear and quadratic terms respectively observed in all cases, and conforming to the usual pattern. Married men, whether disabled or not, are more likely to be employed than single men, while the reverse applies to women, reflecting conventional household roles. In a similar vein, the presence of children generally has a negative effect on participation, although this effect is not significant for disabled men. The presence of an earned source of income by another household member has a positive effect on employment participation, as does possession of a mortgage, while habitation of social housing has the opposite effect. Outright home ownership reduces the likelihood of employment for non-disabled and non-work-limited men, but has no significant effect on work-limited disabled men. The income variable is especially noteworthy. In particular it should be noted that this is not the

[15] In terms of the highest qualification the marginal effect is 0.35 for work-limited disabled males and 0.09 for non-disabled males. A full set of marginal effects is available from the authors on request.

conventional measure of unearned income for an individual, which would be expected to reduce labour supply (as found in Kidd *et al*. 2000). Given the sign of its parameter estimate in Tables 2 and 3, it seems likely that our measure is instead capturing the polarisation of households as being either dual income or no income types (see for example Dickens *et al*. 2000, Table 4).

For the disabled, having a number of health problems reduces the likelihood of employment.[16] There are also significant regional effects, with lower employment participation rates in regions with slacker labour markets compared to the omitted region (the South-East and London). In contrast to non-disabled men, work-limited disabled men have a significantly lower participation rate in Yorkshire and Humberside and Scotland. In the case of women, regional differences between the non-disabled and disabled are more marked. In the North, North-West, Wales and Scotland, participation is significantly lower for the work-limited disabled, but significantly higher for the non-disabled. In other regions there are significant differences for either group, but not the other. On the whole, therefore, particular personal and other characteristics appear to have similar qualitative effects on the probability of employment for both the non-disabled and disabled, although there are some notable exceptions. However, while qualitatively similar, χ^2 tests of parameter equality among the different comparator sub-groups unambiguously reject the null of homogeneity in each case.[17]

4.2 Earnings

In general, it seems to be the case also that earnings are determined in a qualitatively similar fashion for disabled and non-disabled persons (Tables 4 and 5), although F tests of parameter

[16] This result can only be obtained when the non-work-limited disabled are included with the non-disabled. Results not reported here, but available from the authors on request.

[17] For example, testing the pooling restriction for disabled and non-disabled males results in a χ^2 test statistic of 1802.91, while for females the corresponding figure is 1685.27; with 28 degrees of freedom, both are clearly significant.

equality are rejected in all cases, and more comprehensively so, when comparing men and women than in the case of disabled and non-disabled.

In terms of specific coefficient estimates, these are once again largely in accordance with the usual predictions. Thus, wages are higher for those with qualifications relative to those without qualifications in each of the sub-group regressions, with the coefficients generally increasing in magnitude as one progresses up the qualifications hierarchy. Other human capital variables such as (maximum potential) experience and tenure with the current employer are always significant at better than the 1% level, and in all cases there is evidence of the conventional decreasing returns. So far as occupation is concerned, the occupational group dummies are generally significantly negative and of plausible relative magnitudes given the omitted category of managers and senior officials; the only notable exception is females in professional occupations, whose earnings are higher than the base group.

Turning to other variables in these regressions, in conformity with a number of previous studies (see for example Blackaby *et al*. 1998), wages are higher for married men than for single men, irrespective of whether they are disabled, though this variable is insignificant for women and work-limited disabled men. Being employed in a small firm (fewer than 20 employees) is associated with lower earnings for all of our sub-groups. For the housing status variables, these are largely in accordance with priors: being in social housing is negatively related to earnings for all groups, while the reverse is true for those in possession of a mortgage, though not always significantly so. No clear relationship is evident for those who own their home outright, the sign being positive for men and work-limited disabled women and negative for non-disabled women.

As might be expected *a priori* given the omitted category (London and the South East), all regional dummies exhibit negative coefficient signs in each of the four sub-group regressions.

These are significant with just one exception, namely work-limited disabled males in East Anglia. The industry dummies have a fairly consistent effect across the groups, with higher earnings in banking and finance, energy and water, construction, manufacturing, transport and communications. For males, being employed in agriculture and fishing has a significant negative effect for the non-disabled only and distribution and hotels a significant positive effect for the work-limited disabled only. Similarly, for females, being employed in public administration only affects the wage of the non-disabled group. Interestingly, being employed in the public sector confers a wage advantage for women and work-limited disabled men. Finally, the selectivity correction term (lambda) is only significant (with positive sign) for work-limited disabled women and (negatively) for non-disabled women.

4.3 Employment participation, earnings and type of health problem

In Tables 6 and 7 we repeat the preceding analysis, but focus on the disabled groups only, incorporating information for each individual concerning their main type of health problem.[18] Those with each of the broad types of included health problem/disability are significantly more likely to be in employment than the omitted category of mental health.[19,20] The earnings equations also show that for men those with all types of disability earn significantly more than those with mental health problems, but for women only the skin, breathing and organs variable is significant, and then only for those whose disability is work-limiting. For men, this is in contrast to the earlier work of Kidd *et al*., where mental health was associated with a lower employment

[18] It seems plausible that this will be the health problem giving rise to the disability, and for this reason we use the two terms interchangeably in this section.

[19] The marginal effect of the included health dummies being at least 0.09 for work-limited males and 0.11 for work-limited females using 2003 data.

[20] In separate regressions, the number of health problems is negatively and significantly related to being in employment for each of the disabled groups. Since this variable is not defined for the non-disabled, this variable is excluded from the reported tables of results for consistency. These results are however available on request.

probability only. Using the 2003 data suggests therefore, that of the various disability types, mental health is more problematical *both* for gaining entry into the labour market *and* in obtaining earnings comparable to those of other workers. This is an important finding, confirming as it does the findings of *inter alia*, Bunt *et al*. (2001) and Meager *et al*. (1998) concerning the especially acute nature of the labour market disadvantage suffered by those with problems of this type.

The reasons for the acuity of the problem faced by those with mental health problems are difficult to determine, but two factors seem likely to be important. The first is that employers may, for various reasons, be more reluctant to hire those with mental health problems than with other forms of disability, and consequently when this group do find work, they do so at a lower wage.[21] However, it should be noted that the discrimination may in many cases reflect not prejudice, but rather a lack of knowledge concerning, and misconceptions of, the nature of mental health problems and the consequences of, and limitations imposed thereby (Brook 2003).[22] The second is that employers may have a tendency to interpret disability in terms of 'physically obvious, or particularly severe, impairments' (Aston *et al*. 2003: 5), and hence to focus on the *physical* adaptations to premises required under the DDA, rather than adjustments to working arrangements.[23] This implies that employers may therefore, inadvertently, not be as accommodating to the needs of those with mental health problems. There is also evidence to suggest that they are less likely to make adaptations for new hires (Goldstone with Meager

[21] The differences in labour market outcomes between mental health and all other health problems can be decomposed into the effects of characteristics and coefficients. The proportion explained by differences in characteristics is only 19% for the participation probit but 75% for the wage gap (using Cotton, 1988 style weights); for employment therefore, coefficient differences represent much the greater part of the phenomenon. Another reason employers may not hire people with mental disabilities is that they may have lower productivity in ways that are difficult to control for.

[22] Article published in the Guardian G2 supplement, 3 June 2003.

[23] Examples of working arrangement alterations include re-allocation of duties, changes to working hours, accommodating absence during working hours for treatment, etc.

2002);[24] the high inactivity rates of those with mental health problems may therefore make this especially problematic for this group when they attempt to (re) join the labour market.

4.4 Gender and disability decompositions

A key feature of our analysis is to decompose the differences between the disabled and non-disabled and also between genders. Thus we have two types of wage decomposition.[25] The first, following DeLeire, compares each of the two types of disabled (work-limited and non-work-limited) with the non-disabled separately for men and women, and of necessity excludes types of disability (Table 8). The gender decompositions in contrast, compare the earnings of men and women within each of the disability categories (work-limited disabled, non-work-limited disabled and non-disabled) to examine whether the earnings impact of disability varies by gender.

4.4.1 *Disability decompositions*. For the first of the two decomposition types above, Table 8 indicates that for both men and women, the percentage 'explained' typically constitutes somewhat less than half the differential between the non-disabled and the work-limited disabled in 1997 (panel (a)), and is lower for men than women, regardless of the basis of comparison, while the raw differential is larger. By 2003 however (panel (b)), the situation has largely been reversed, with the raw differential now being larger for women, and the 'unexplained' (discriminatory/residual) component for this group having increased to approximately three

[24] Survey evidence also suggests that employers who have sick/disabled employees do not fully recognise adjustments made to work arrangements unless prompted, or at least to recognise them as being specifically related to disability (Goldstone with Meager, 2002).

[25] Decompositions of the employment probits indicate a low 'explained' component (20% for males, compared to around 50% in both Blackaby *et al*., 1999 and Kidd *et al*., 2000), and for this reason details are not documented here (results are available from the corresponding author on request, together with detailed wage decompositions). To the extent that the 'unexplained' component is interpreted as reflecting discrimination, this suggests that in terms of employment at least, the situation for disabled persons may not have improved since the passing of the DDA.

quarters of the differential, in comparison with around half for men, again irrespective of the basis of comparison. Thus the relative position of work-limited disabled women compared to the non-disabled has clearly worsened over the period. While the 2003 results contrast with Blackaby *et al.* (1999), whose findings are more akin to our 1997 results, they are consistent with discrimination being more substantial for disabled women than for disabled men, assuming the same impact from omitted types of disability variables.

Considering the non-work-limited disabled (panels (c) and (d)), differentials are very small in both years. In the case of males, the offer wage for the disabled actually exceeds that of the non-disabled in 2003 (panel (d)), albeit the gap is tiny (0.003), and is wholly explained by characteristics. For non-work-limited women, the raw differential is in favour of the non-disabled and is bigger (0.035), of which 80% is unexplained in the pooled decomposition. In 1997 the raw differential was larger and in favour of the non-disabled for men, suggesting that the position of this group of disabled workers has improved. In contrast, there is little change between the two years for non-work-limited women, albeit the explained proportion has increased somewhat. These results therefore appear to indicate that the relative position of non-work-limited disabled women, compared to the corresponding male disabled group has also deteriorated, even if, for non-work-limited disabled women their position relative to the non-disabled has not. However, as Table 8 panels (c) and (d) indicate, for those whose disability is not work-limiting, endowments (measured productivity differences) contribute very little to these measured wage differentials. The small 'unexplained' component, by assumption, captures discrimination. On this basis, there is little therefore to suggest substantial discrimination against the disabled, at least where disability is not work-limiting in nature, and its absolute magnitude has fallen over time for both men and women.

4.4.2 *Gender decompositions*. Table 9 next presents gender wage decompositions to examine whether the disadvantage of disabled women relative to disabled men is greater or less than the disadvantage of non-disabled women to non-disabled men. In the US, Baldwin and Johnson (1995) report that while disabled women face a double penalty in the labour market from gender and disability, the gender gap is no larger for the disabled. In our data, the raw earnings differential is larger for each of the two disabled groups in 2003 (panel (a)) compared with 1997 (panel (b)), which confirms the worsening position of disabled women, and in particular those whose disability is work-limiting, relative to men. Particularly noteworthy is that the percentage 'unexplained' is typically greatest for those whose disability is work-limiting, which is again consistent with a discrimination interpretation. When the type of health problem is controlled for in the gender decomposition (panels (c) and (d) of Table 9), the unexplained wage gap decreases marginally for the work-limited disabled, indicating a possible gender difference in the impact of types of disability on earnings. One possible reason why women may be at a disadvantage is that men are more likely to be injured at work and may be accommodated better by their employer.

4.4.3 *Time-wise decompositions*. In order to examine the factors contributing to changes over time, we present time-wise decompositions using deflated wages for 2003 based on eq. (5) for each of our six sub-groups (Table 10). As can be seen, very different patterns emerge for men and women, as might be expected given the preceding discussion. For men, the biggest gain in real terms occurred for the work-limited disabled and the lowest for the non-disabled. In contrast, for women, the improvement was greater for the non-work-limited disabled and the non-disabled, both of whom have a very similar gain in real terms. For work-limited women the gain is, however, very modest (0.047), confirming the previous discussion. For men, the bulk of the

improvement is unexplained by variables in our model, and the percentage unexplained is slightly higher for the work-limited disabled. In the case of women, while only about a quarter of the improvement can be explained for the non-work-limited disabled and non-disabled, for the work-limited disabled the improvement is fully explained by variables in our model. This implies that legislation cannot have played any part in the wage gains of work-limited disabled women, but there is some scope for interpreting our results as indicating a positive impact on the earnings of work-limited disabled men.

This is perhaps clearer if, following DeLeire (2000), we identify separately the contributions of observed and unobserved characteristics and discrimination. As noted earlier, since the non-work limited disabled are assumed have no unobserved productivity difference, the entire unexplained component of the wage differential between the non-work limited and the non-disabled reflects discrimination. In contrast, for the work-limited disabled, the unexplained component captures both discrimination and unobserved (health) productivity differences. Using the two decompositions, it is possible to isolate these last two effects. As Table 11, panel (a) indicates, for males, the differential has fallen over time. This improvement is largely the consequence of decreases in the absolute sizes of the unobserved (health) and discriminatory components rather than observed characteristics, which might therefore be taken as evidence of the beneficial impact of the legislation for men, the former being consistent with disability having less impact on work. For females in contrast (panel (b)), the differential has increased over time, primarily due to a large rise in the contribution of unobserved (health) effects. While the absolute magnitude of the discrimination component has fallen marginally (and halved in relative terms), taken as a whole, the evidence does not support the view that the legislation has

significantly improved the relative earnings of the female work-limited disabled. As such, it would appear that the legislation may have impacted in an unforeseen, gender-specific manner.

4.4.4 *Employment effects*.[26] The last aspect of our analysis is to examine the employment implications of the wage discrimination for both men and women. This is undertaken using the Baldwin and Johnson (1992) methodology, deployed in Kidd *et al*. (2000). Their procedure involves two steps. First, the coefficient estimates of the probit model are used to predict the probability of employment for average disabled and non-disabled individuals. Thus:

$$\pi_j = \Phi\left(\frac{\gamma_j}{\sigma_{uj}}\overline{Y}_j\right) \qquad (j = D, A) \tag{6}$$

where $\pi_j =$ the probability of employment for an average man or women, Φ = the cumulative density function and $\frac{\gamma_j}{\sigma_{uj}}\overline{Y}_j$ is the adjusted offer wage – reservation wage. Second, the average probability of employment in the absence of discrimination (π_j^*) is estimated. A Heckman model of labour supply is estimated on the assumption that hours worked are proportional to the gap between the offer and reservation wages, which allows σ_{uj} to be estimated as a by-product of the hours of work equation. Labour market experience, which is included in the wage offer specification, is excluded from the reservation wage model in order to provide identification. On this basis the above equation is adjusted to become:

$$\pi_j^* = \Phi\left(\frac{\gamma_j}{\sigma_{uj}}\overline{Y}_j + \left[\frac{\overline{W}_j^{O*} - \overline{W}_j^{O}}{\sigma_{uj}}\right]\right) \tag{7}$$

[26] Throughout this section, 'discrimination' refers to the entire unexplained wage gap consistent with previous literature.

where $\overline{W}_j^{O*}$ is the non-discriminatory offer wage. From this it is then possible to compare employment rates for the comparator groups in the presence and absence of discrimination.

The results of this procedure are set out in Table 12 for 1997 and 2003. These are restricted to consideration of the work-limited disabled, for whom, given the more substantial nature of wage differentials, such effects are likely to be larger. The top part of the table sets out the predicted employment participation probabilities for the disabled and non-disabled in the presence and absence of discrimination, with the non-discriminatory wage structure being a weighted average of the disabled and non-disabled returns for the gender group under consideration, with the weights being the proportions of each group in the relevant populations. Predictably, male employment participation rates are higher than for females, and for the non-disabled compared to the disabled. As can be seen, the employment effects of changing to the alternative wage structure are in all cases small, particularly for the non-disabled, and in terms of elasticities, in several cases (all in the case of women), the sign is actually negative. The group with the largest positive employment elasticity is perhaps not surprisingly, disabled men, although even here it remains inelastic. As Kidd *et al*. (2000: 977-978) indicate: 'This is important from a policy viewpoint – it suggests that wage discrimination *per se* may be important but the implied employment effect associated with the discriminatory wage reduction is very small'.

5. Conclusions.

In this paper, while recognising the difficulties in identifying the effect of disability on labour market outcomes, we attempt to assess the impact of the Disability Discrimination Act for the disabled and to compare the effect of disability by gender. The evidence suggests that substantial

differences in both likelihood of employment and levels of earnings remain, even after several years of operation of the Disability Discrimination Act. Significant heterogeneity within the disabled group is also identified, with the type of health problem having an important influence on employment and earnings. As with ethnicity, it becomes important to differentiate between the sub-groups to identify those who face the greatest labour market disadvantage. The evidence suggests that those suffering from mental health forms of disability fare particularly badly, and indicates that future efforts may need to be directed towards assisting this particular group. Although our data do not allow us to investigate the reasons for the particularly extreme degree of disadvantage faced by this group, part of the answer may reside in improving employers' access to information concerning the various types of mental illness and their implications for work. It may also be helpful to emphasise the 'reasonable adjustments' that can be made for workers with this type of disability; the popular conception of such adjustments perhaps being more with physical environment.

Distinguishing between work-limited and non work-limited disabled workers, following DeLeire (2000), we find discrimination, albeit a small percentage of the overall wage gap, has fallen for men over time in terms of our wage decompositions, but some discrimination remains in 2003 in the case of women. One might conclude therefore, that the legislation, to the extent it has had an impact has been helpful in the case of men, but less so in the case of women, and in particular, for women whose disability is work-limiting. Consistent evidence to this effect is provided by both gender and time-wise decompositions. For men, the improvement in earnings over time is not due to changes in characteristics, which leaves room for a positive impact of the legislation. For women in contrast, not only has the wage gap between the disabled and non-disabled grown, but also any improvement in their position in the post-DDA period is the

consequence of changes in characteristics, leaving little scope for the role of legislation. This suggests that the legislation may have impacted differentially by gender.

Finally, in terms of the employment effects associated with discrimination in wages against the disabled, we find little evidence using the Baldwin and Johnson (1992) methodology that these are substantial, and indeed for women, such effects are somewhat perverse. However, there is a suggestion that the male (work-limited) disabled may be becoming less sensitive to earnings over the period of operation of the DDA.

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Table 1 .
Summary statistics

(a) Male variable means

Variable	Work-limited disabled		Non-work-limited disabled		Non-disabled	
	1997	2003	1997	2003	1997	2003
Log hour pay	1.822	2.109	2.013	2.280	2.001	2.275
Quarter 2	0.247	0.246	0.243	0.260	0.251	0.246
Quarter 3	0.256	0.250	0.263	0.240	0.248	0.250
Quarter 4	0.256	0.247	0.273	0.250	0.246	0.246
Region 1	0.080	0.079	0.065	0.058	0.055	0.056
Region 2	0.106	0.100	0.087	0.103	0.089	0.098
Region 3	0.070	0.075	0.081	0.077	0.071	0.074
Region 4	0.032	0.033	0.045	0.039	0.040	0.034
Region 6	0.070	0.080	0.081	0.091	0.082	0.086
Region 7	0.090	0.093	0.101	0.090	0.098	0.097
Region 8	0.133	0.122	0.096	0.105	0.104	0.095
Region 9	0.074	0.069	0.048	0.047	0.047	0.047
Region 10	0.115	0.102	0.092	0.091	0.099	0.096
Occupation 2	0.083	0.110	0.119	0.131	0.116	0.144
Occupation 3	0.086	0.118	0.089	0.133	0.093	0.142
Occupation 4	0.090	0.064	0.074	0.054	0.076	0.052
Occupation 5	0.181	0.168	0.179	0.154	0.171	0.154
Occupation 6	0.085	0.034	0.072	0.026	0.072	0.022
Occupation 7	0.045	0.040	0.054	0.038	0.055	0.046
Occupation 8	0.187	0.154	0.159	0.144	0.147	0.122
Occupation 9	0.107	0.173	0.065	0.123	0.075	0.120
Industry 1	0.016	0.012	0.012	0.011	0.013	0.010
Industry 2	0.016	0.020	0.015	0.024	0.020	0.019
Industry 3	0.295	0.229	0.299	0.252	0.288	0.234
Industry 4	0.075	0.072	0.082	0.080	0.080	0.087
Industry 5	0.178	0.176	0.147	0.151	0.166	0.174
Industry 6	0.085	0.109	0.088	0.102	0.093	0.099
Industry 7	0.110	0.129	0.126	0.140	0.139	0.153
Industry 8	0.180	0.196	0.184	0.192	0.159	0.182
Days illness	0.579	0.200	0.180	0.081	0.122	0.057
Married	0.619	0.561	0.642	0.643	0.563	0.519
Experience	30.932	30.794	25.351	27.360	19.523	19.307
Exp squared	1155.792	1142.767	853.355	953.120	566.815	564.113
Age	46.840	47.088	42.213	44.589	36.802	37.030
Age squared	2372.337	2391.270	1972.012	2171.053	1523.036	1547.304
Qual 1	0.056	0.077	0.136	0.175	0.162	0.204
Qual 2	0.048	0.057	0.081	0.095	0.084	0.084

Qual 3	0.277	0.263	0.314	0.324	0.297	0.288
Qual 4	0.109	0.132	0.174	0.161	0.196	0.195
Qual 5	0.169	0.161	0.157	0.131	0.140	0.124
Small firm	0.261	0.264	0.218	0.235	0.231	0.236
Part-time	0.123	0.128	0.068	0.073	0.068	0.079
White	0.945	0.929	0.960	0.952	0.939	0.917
Tenure	9.143	8.915	9.958	10.249	8.336	8.087
Ten squared	177.992	173.531	197.238	209.812	147.036	142.740
Public sector	0.218	0.205	0.223	0.216	0.198	0.199
Activity	0.267	0.310	0.812	0.807	0.794	0.783
Dependent children	0.465	0.442	0.545	0.504	0.647	0.616
Hourly pay	7.468	9.704	8.971	11.512	8.861	11.653
Overtime	4.179	3.633	4.934	4.305	4.828	4.092
Social housing	0.349	0.331	0.140	0.109	0.135	0.108
Home owned	0.226	0.248	0.181	0.233	0.137	0.163
Home mortgaged	0.348	0.334	0.599	0.579	0.622	0.614
Other earner	0.412	0.416	0.643	0.636	0.665	0.675
Number of health problems	2.760	2.678	1.430	1.424	0.000	0.000

(b) Female variable means

Variable	**Work-limited disabled**		**Non-work-limited disabled**		**Non-disabled**	
	1997	2003	1997	2003	1997	2003
Log hour pay	1.588	1.913	1.707	2.014	1.720	2.033
Quarter 2	0.250	0.256	0.262	0.249	0.251	0.250
Quarter 3	0.257	0.259	0.262	0.245	0.248	0.246
Quarter 4	0.254	0.241	0.259	0.255	0.247	0.246
Region 1	0.071	0.073	0.061	0.058	0.056	0.057
Region 2	0.097	0.100	0.097	0.106	0.089	0.097
Region 3	0.065	0.075	0.077	0.074	0.071	0.073
Region 4	0.034	0.031	0.041	0.032	0.038	0.035
Region 6	0.069	0.082	0.089	0.092	0.082	0.085
Region 7	0.099	0.102	0.089	0.086	0.095	0.092
Region 8	0.130	0.110	0.093	0.099	0.105	0.100
Region 9	0.074	0.068	0.049	0.047	0.050	0.048
Region 10	0.110	0.099	0.083	0.094	0.099	0.096
Occupation 2	0.079	0.081	0.095	0.101	0.097	0.117
Occupation 3	0.089	0.131	0.114	0.137	0.113	0.147
Occupation 4	0.242	0.212	0.255	0.246	0.263	0.230
Occupation 5	0.029	0.019	0.024	0.019	0.022	0.016
Occupation 6	0.162	0.146	0.168	0.131	0.159	0.129
Occupation 7	0.126	0.137	0.109	0.122	0.120	0.123
Occupation 8	0.058	0.037	0.051	0.026	0.041	0.024

Occupation 9	0.131	0.158	0.091	0.119	0.081	0.115
Industry 1	0.007	0.003	0.006	0.003	0.006	0.003
Industry 2	0.004	0.004	0.003	0.005	0.005	0.005
Industry 3	0.120	0.077	0.117	0.073	0.117	0.082
Industry 4	0.013	0.012	0.011	0.017	0.013	0.015
Industry 5	0.241	0.240	0.213	0.208	0.232	0.221
Industry 6	0.032	0.031	0.028	0.039	0.036	0.037
Industry 7	0.125	0.122	0.141	0.141	0.145	0.146
Industry 8	0.401	0.453	0.426	0.469	0.390	0.436
Days illness	0.718	0.207	0.263	0.092	0.174	0.071
Married	0.593	0.557	0.596	0.599	0.599	0.551
Experience	27.362	27.279	22.666	24.039	18.903	18.911
Exp squared	907.255	901.128	691.913	748.515	509.725	514.366
Age	43.337	43.641	39.428	41.151	36.027	36.471
Age squared	2017.056	2041.899	1713.105	1845.270	1434.132	1471.005
Qual 1	0.041	0.068	0.091	0.130	0.114	0.162
Qual 2	0.068	0.079	0.107	0.106	0.095	0.097
Qual 3	0.109	0.128	0.140	0.174	0.160	0.184
Qual 4	0.195	0.220	0.274	0.271	0.292	0.281
Qual 5	0.168	0.158	0.172	0.154	0.153	0.133
Small firm	0.356	0.319	0.299	0.295	0.308	0.289
Part-time	0.503	0.518	0.399	0.409	0.440	0.432
White	0.934	0.915	0.944	0.943	0.935	0.909
Tenure	6.924	7.089	7.493	8.043	6.253	6.600
Tenure squared	97.799	104.538	112.994	130.197	81.612	93.351
Public sector	0.351	0.371	0.386	0.389	0.345	0.370
Activity	0.274	0.312	0.724	0.709	0.679	0.685
Dependent children	0.610	0.645	0.689	0.703	0.872	0.880
Hourly pay	5.799	7.934	6.429	8.567	6.569	8.910
Overtime	2.468	2.044	2.684	2.403	2.444	2.261
Social housing	0.360	0.342	0.198	0.170	0.168	0.147
Home owned	0.175	0.198	0.148	0.199	0.131	0.150
Home mortgaged	0.391	0.377	0.562	0.545	0.598	0.595
Other earner	0.506	0.510	0.681	0.682	0.725	0.722

Notes: In all cases figures relate to the estimation samples used.

Table 2.
Male labour force participation probit estimates, 2003

	Work-limited disabled		Non-work-limited disabled		Non-disabled	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Constant	-3.372	-16.56 ***	-4.834	-18.82 ***	-5.068	-51.73 ***
Qual 1	0.946	14.09 ***	0.170	1.89 *	0.433	11.68 ***
Qual 2	0.860	11.49 ***	0.013	0.13	0.452	9.58 ***
Qual 3	0.587	12.32 ***	0.323	4.22 ***	0.437	13.19 ***
Qual 4	0.620	10.96 ***	0.218	2.49 **	0.481	13.66 ***
Qual 5	0.421	7.77 ***	0.310	3.39 ***	0.434	11.27 ***
Age	0.118	12.75 ***	0.252	20.62 ***	0.256	51.06 ***
Age squared	-0.002	-14.64 ***	-0.003	-20.19 ***	-0.003	-49.11 ***
Married	0.212	4.83 ***	0.176	2.63 ***	0.201	7.02 ***
Region 1	-0.278	-3.96 ***	-0.267	-2.50 **	-0.131	-2.98 ***
Region 2	-0.124	-2.00 **	0.016	0.17	0.030	0.83
Region 3	-0.095	-1.37	0.079	0.77	0.046	1.11
Region 4	-0.107	-1.11	0.069	0.51	-0.020	-0.35
Region 6	0.103	1.57	0.048	0.52	0.129	3.26 ***
Region 7	-0.080	-1.25	-0.104	-1.16	0.114	3.08 ***
Region 8	-0.230	-3.82 ***	-0.260	-3.12 ***	-0.081	-2.26 **
Region 9	-0.458	-5.99 ***	-0.129	-1.11	-0.130	-2.72 ***
Region 10	-0.219	-3.42 ***	-0.120	-1.33	-0.007	-0.19
White	0.388	5.52 ***	0.602	5.96 ***	0.578	17.36 ***
Dependent children	0.017	0.84	-0.024	-0.67	-0.034	-2.53 **
Other earner	0.462	12.40 ***	0.500	9.44 ***	0.345	15.47 ***
Social housing	-0.509	-7.89 ***	-0.323	-3.19 ***	-0.349	-9.32 ***
Home owned	0.028	0.43	-0.305	-3.23 ***	-0.104	-2.88 ***
Home mortgaged	0.360	5.81 ***	0.328	3.71 ***	0.383	12.46 ***
No obs	7780		4834		27302	
Log likelihood	-3685.03		-1761.43		-10410.35	
χ^2 p-value	0.000		0.000		0.000	
Pseudo-R^2	0.235		0.258		0.270	

Notes: Regressions also include dummy variables for the quarter in which the individual was surveyed. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. The χ^2 statistic is a test that all slope coefficients are zero. Pseudo-R^2 is McFadden's measure, defined as 1 minus the ratio of the maximised log-likelihood from the regression to that from a regression including the optimal constant only (Maddala, 1983).

Table 3.
Female labour force participation probit estimates, 2003

	Work-limited disabled		**Non-work-limited disabled**		**Non-disabled**	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Constant	-3.208	-14.80 ***	-4.819	-18.86 ***	-4.814	-50.61 ***
Qual 1	1.030	15.27 ***	0.722	9.19 ***	0.720	23.41 ***
Qual 2	0.960	15.33 ***	0.739	9.12 ***	0.842	23.91 ***
Qual 3	0.763	14.1 ***	0.638	9.17 ***	0.544	19.24 ***
Qual 4	0.664	14.02 ***	0.640	10.25 ***	0.561	21.72 ***
Qual 5	0.538	10.38 ***	0.422	6.24 ***	0.402	13.69 ***
Age	0.108	10.21 ***	0.227	17.26 ***	0.233	44.42 ***
Age squared	-0.001	-10.95 ***	-0.003	-15.95 ***	-0.003	-40.10 ***
Married	-0.113	-2.84 ***	-0.235	-4.43 ***	-0.235	-10.86 ***
Region 1	-0.138	-1.98 **	-0.018	-0.20	0.093	2.56 **
Region 2	-0.075	-1.25	0.114	1.60	0.136	4.65 ***
Region 3	-0.052	-0.77	-0.001	-0.01	0.179	5.43 ***
Region 4	-0.176	-1.83 *	0.212	1.76 *	0.037	0.86
Region 6	0.003	0.04	0.105	1.37	0.164	5.28 ***
Region 7	-0.079	-1.31	0.073	0.96	0.135	4.55 ***
Region 8	-0.217	-3.63 ***	0.138	1.88 *	0.081	2.80 ***
Region 9	-0.261	-3.63 ***	0.055	0.55	0.123	3.15 ***
Region 10	-0.225	-3.61 ***	0.023	0.31	0.178	5.92 ***
White	0.498	7.32 ***	0.530	6.40 ***	0.515	18.49 ***
Dependent children	-0.164	-8.41 ***	-0.370	-15.39 ***	-0.377	-41.03 ***
Other earner	0.425	11.14 ***	0.363	7.52 ***	0.292	14.55 ***
Social housing	-0.441	-6.92 ***	-0.096	-1.20	-0.141	-4.52 ***
Home owned	0.023	0.34	-0.077	-0.93	-0.032	-0.99
Home mortgaged	0.319	5.24 ***	0.444	6.09 ***	0.405	15.36 ***
No obs	7938		5309		33023	
Log likelihood	-3983.83		-2635.48		-16575.36	
χ^2 p-value	0.000		0.000		0.000	
Pseudo-R^2	0.192		0.177		0.194	

Notes: See notes to Table 2.

Table 4.
Male selectivity-corrected wage equations, 2003

	Work-limited disabled		**Non-work-limited disabled**		**Non-disabled**	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Constant	1.833	14.55 ***	1.912	23.76 ***	1.879	51.58 ***
Region 1	-0.163	-4.21 ***	-0.151	-5.11 ***	-0.207	-16.04 ***
Region 2	-0.156	-4.81 ***	-0.157	-6.94 ***	-0.194	-19.30 ***
Region 3	-0.096	-2.66 ***	-0.144	-5.70 ***	-0.187	-16.72 ***
Region 4	0.024	0.49	-0.167	-5.00 ***	-0.159	-10.16 ***
Region 6	-0.087	-2.75 ***	-0.109	-4.56 ***	-0.163	-15.76 ***
Region 7	-0.076	-2.27 **	-0.126	-5.22 ***	-0.157	-15.56 ***
Region 8	-0.110	-3.33 ***	-0.123	-5.20 ***	-0.187	-18.16 ***
Region 9	-0.120	-2.58 ***	-0.158	-4.92 ***	-0.198	-14.19 ***
Region 10	-0.073	-2.11 **	-0.138	-5.65 ***	-0.177	-17.26 ***
Occupation 2	0.001	0.02	-0.076	-3.16 ***	-0.051	-5.05 ***
Occupation 3	-0.173	-4.90 ***	-0.159	-6.82 ***	-0.154	-15.42 ***
Occupation 4	-0.358	-8.25 ***	-0.371	-11.71 ***	-0.382	-27.46 ***
Occupation 5	-0.375	-11.12 ***	-0.379	-16.38 ***	-0.392	-38.84 ***
Occupation 6	-0.405	-7.24 ***	-0.533	-11.99 ***	-0.468	-22.97 ***
Occupation 7	-0.526	-10.19 ***	-0.463	-12.1 ***	-0.437	-28.14 ***
Occupation 8	-0.517	-14.91 ***	-0.496	-20.32 ***	-0.473	-42.46 ***
Occupation 9	-0.582	-16.73 ***	-0.579	-22.32 ***	-0.526	-45.97 ***
Industry 1	0.071	0.80	-0.168	-2.43 **	-0.053	-1.74 *
Industry 2	0.320	4.42 ***	0.210	4.05 ***	0.197	8.14 ***
Industry 3	0.225	5.19 ***	0.085	2.52 **	0.098	6.40 ***
Industry 4	0.280	5.58 ***	0.123	3.25 ***	0.157	9.33 ***
Industry 5	0.148	3.38 ***	-0.039	-1.13	-0.016	-1.06
Industry 6	0.242	5.22 ***	0.106	2.93 ***	0.100	6.12 ***
Industry 7	0.313	6.94 ***	0.182	5.23 ***	0.212	13.63 ***
Industry 8	0.121	2.66 ***	0.032	0.93	0.070	4.36 ***
Days illness	-0.023	-2.38 **	-0.008	-0.64	-0.025	-4.02 ***
Married	0.037	1.5	0.082	4.91 ***	0.070	10.11 ***
Experience	0.017	5.02 ***	0.027	8.58 ***	0.032	22.93 ***
Exp squared	0.000	-4.23 ***	0.000	-7.98 ***	-0.001	-20.18 ***
Qual 1	0.343	6.61 ***	0.374	12.11 ***	0.399	27.63 ***
Qual 2	0.200	3.89 ***	0.166	5.20 ***	0.203	13.44 ***
Qual 3	0.138	3.57 ***	0.094	3.68 ***	0.135	10.77 ***
Qual 4	0.120	2.88 ***	0.039	1.42	0.066	5.10 ***
Qual 5	0.103	2.70 ***	0.020	0.70	0.069	5.11 ***
Small firm	-0.120	-5.78 ***	-0.113	-7.27 ***	-0.144	-21.13 ***
Part-time	-0.144	-4.99 ***	-0.057	-2.09 **	-0.049	-4.19 ***

White	0.016	0.36	0.034	0.96	0.073	5.60 ***
Tenure	0.012	4.13 ***	0.011	5.53 ***	0.011	10.96 ***
Ten squared	0.000	-1.87 *	0.000	-2.14 **	0.000	-5.03 ***
Public sector	0.062	1.84 *	-0.006	-0.25	-0.019	-1.68 *
Overtime	0.003	1.98 **	0.006	5.60 ***	0.005	10.10 ***
Social housing	-0.088	-1.96 **	-0.034	-1.00	-0.074	-5.09 ***
Home owned	0.042	1.16	0.052	1.74 *	0.017	1.43
Home mortgaged	0.084	2.32 **	0.090	3.46 ***	0.061	6.18 ***
Lambda	0.010	0.18	0.041	0.74	0.029	1.16
No obs	2409		3899		21389	
RSS	424.70		593.83		3377.51	
F (p-value)	0.000		0.000		0.000	
$\overline{R}^2$	0.447		0.545		0.54	

Notes: Regressions also include dummy variables for the quarter in which the individual was surveyed. ***, ** and * denote significance at the 1%, 5% and 10% level respectively. RSS denotes the residual sum of squares. The F test is a test that all slope coefficients are zero.

Table 5.
Female selectivity-corrected wage equations, 2003

	Work-limited disabled		Non-work-limited disabled		Non-disabled	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Constant	1.464	12.59 ***	2.029	27.37 ***	2.007	68.85 ***
Region 1	-0.174	-4.86 ***	-0.140	-5.30 ***	-0.164	-14.41 ***
Region 2	-0.155	-5.33 ***	-0.115	-5.65 ***	-0.162	-17.60 ***
Region 3	-0.150	-4.78 ***	-0.125	-5.26 ***	-0.152	-15.01 ***
Region 4	-0.034	-0.72	-0.094	-2.88 ***	-0.121	-8.67 ***
Region 6	-0.122	-4.29 ***	-0.094	-4.41 ***	-0.140	-14.82 ***
Region 7	-0.126	-4.29 ***	-0.103	-4.65 ***	-0.154	-16.40 ***
Region 8	-0.146	-4.81 ***	-0.123	-5.92 ***	-0.135	-14.69 ***
Region 9	-0.162	-4.23 ***	-0.117	-4.09 ***	-0.156	-12.75 ***
Region 10	-0.162	-5.04 ***	-0.106	-4.96 ***	-0.139	-15.22 ***
Occupation 2	0.073	1.75 *	0.094	3.35 ***	0.059	5.09 ***
Occupation 3	-0.067	-1.84 *	-0.072	-2.90 ***	-0.117	-11.05 ***
Occupation 4	-0.279	-8.27 ***	-0.251	-11.02 ***	-0.322	-32.32 ***
Occupation 5	-0.343	-5.34 ***	-0.426	-9.16 ***	-0.489	-22.54 ***
Occupation 6	-0.385	-10.41 ***	-0.427	-16.02 ***	-0.477	-40.80 ***
Occupation 7	-0.365	-9.57 ***	-0.350	-12.82 ***	-0.458	-38.13 ***
Occupation 8	-0.454	-8.23 ***	-0.413	-9.27 ***	-0.558	-28.66 ***
Occupation 9	-0.460	-12.26 ***	-0.469	-17.00 ***	-0.539	-44.45 ***
Industry 1	0.156	1.06	-0.041	-0.39	0.037	0.84
Industry 2	0.117	0.93	0.256	3.07 ***	0.233	6.29 ***
Industry 3	0.142	3.00 ***	0.072	1.96 **	0.153	10.30 ***
Industry 4	0.326	4.15 ***	0.114	2.21 **	0.147	6.33 ***
Industry 5	0.011	0.28	-0.097	-3.09 ***	-0.010	-0.77
Industry 6	0.180	3.30 ***	0.173	4.33 ***	0.170	10.10 ***
Industry 7	0.206	5.10 ***	0.142	4.52 ***	0.204	15.82 ***
Industry 8	0.054	1.46	0.013	0.46	0.047	3.92 ***
Days illness	-0.035	-3.93 ***	-0.012	-1.18	-0.005	-1.03
Married	-0.004	-0.20	0.001	0.04	0.005	0.79
Experience	0.018	6.47 ***	0.019	8.27 ***	0.018	20.19 ***
Exp squared	0.000	-6.44 ***	0.000	-8.19 ***	0.000	-19.43 ***
Qual 1	0.483	9.25 ***	0.338	10.83 ***	0.327	24.06 ***
Qual 2	0.310	6.44 ***	0.210	7.20 ***	0.184	13.74 ***
Qual 3	0.207	4.99 ***	0.047	1.83 *	0.094	8.23 ***
Qual 4	0.171	4.62 ***	0.042	1.77 *	0.034	3.20 ***
Qual 5	0.137	3.78 ***	0.017	0.73	0.030	2.65 ***
Small firm	-0.061	-3.41 ***	-0.084	-6.33 ***	-0.082	-14.09 ***
Part-time	-0.036	-2.05 **	-0.064	-4.77 ***	-0.025	-4.29 ***

White	0.064	1.52	-0.093	-2.88 ***	-0.007	-0.60
Tenure	0.014	4.52 ***	0.012	5.68 ***	0.016	15.24 ***
Ten squared	0.000	-1.07	0.000	-2.23 **	0.000	-6.54 ***
Public sector	0.103	4.32 ***	0.045	2.52 **	0.047	5.93 ***
Overtime	0.003	1.31	0.005	3.80 ***	0.005	7.75 ***
Social housing	-0.044	-1.08	-0.032	-1.16	-0.028	-2.31 **
Home owned	0.065	1.90 *	0.022	0.84	-0.004	-0.33
Home mortgaged	0.110	3.45 ***	0.020	0.85	0.009	0.98
lambda	0.156	3.00 ***	-0.022	-0.57	-0.058	-3.83 ***
No obs	2478		3764		22627	
RSS	357.13		453.52		3088.54	
F (p-value)	0.000		0.000		0.000	
$\overline{R}^2$	0.446		0.522		0.531	

Notes: See notes to Table 4.

Table 6.
Disabled labour force participation probit estimates including health problem type, 2003

	Male				Female			
	Work-limited disabled		Non-work-limited disabled		Work-limited disabled		Non-work-limited disabled	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Constant	-3.857	-18.10 ***	-5.237	-18.80***	-3.775	-16.73 ***	-5.231	-18.90***
Qual 1	0.926	13.45 ***	0.152	1.69*	1.018	14.85 ***	0.728	9.23***
Qual 2	0.843	11.02 ***	0.003	0.03	0.936	14.71 ***	0.747	9.18***
Qual 3	0.527	10.85 ***	0.308	4.01***	0.724	13.17 ***	0.653	9.34***
Qual 4	0.561	9.69 ***	0.213	2.42**	0.634	13.16 ***	0.646	10.30***
Qual 5	0.380	6.89 ***	0.314	3.40***	0.513	9.79 ***	0.431	6.35***
Age	0.120	12.63 ***	0.251	20.50***	0.117	10.84 ***	0.230	17.30***
Age squared	-0.002	-14.92 ***	-0.003	-20.10***	-0.002	-11.85 ***	-0.003	-16.10***
Married	0.156	3.50 ***	0.170	2.53**	-0.140	-3.46 ***	-0.231	-4.34***
Region 1	-0.320	-4.48 ***	-0.285	-2.65***	-0.147	-2.09 **	-0.020	-0.23
Region 2	-0.139	-2.20 **	0.014	0.15	-0.097	-1.60	0.116	1.62
Region 3	-0.109	-1.55	0.075	0.73	-0.066	-0.98	0.002	0.02
Region 4	-0.144	-1.47	0.059	0.44	-0.198	-2.03 **	0.231	1.90*
Region 6	0.113	1.69 *	0.038	0.41	-0.001	-0.01	0.111	1.45
Region 7	-0.098	-1.50	-0.105	-1.16	-0.101	-1.66 *	0.079	1.04
Region 8	-0.240	-3.90 ***	-0.253	-3.03***	-0.241	-3.96 ***	0.139	1.89*
Region 9	-0.485	-6.21 ***	-0.112	-0.95	-0.283	-3.89 ***	0.053	0.53
Region 10	-0.221	-3.41 ***	-0.124	-1.36	-0.230	-3.63 ***	0.024	0.31
White	0.449	6.28 ***	0.610	6.02***	0.560	8.16 ***	0.540	6.48***
Dependent children	0.003	0.15	-0.026	-0.71	-0.185	-9.30 ***	-0.370	-15.40***
Other earner	0.448	11.85 ***	0.489	9.19***	0.402	10.39 ***	0.350	7.22***
Social housing	-0.499	-7.56 ***	-0.317	-3.11***	-0.425	-6.56 ***	-0.098	-1.22
Home owned	0.050	0.75	-0.314	-3.31***	0.041	0.60	-0.082	-0.99
Home mortgaged	0.362	5.72 ***	0.312	3.52***	0.331	5.35 ***	0.436	5.96***

Health1	0.721	11.79 ***	0.500	3.89***	0.576	10.30 ***	0.391	3.61***
Health2	0.792	8.05 ***	0.537	3.49***	0.660	6.76 ***	0.455	3.08***
Health3	0.757	12.09 ***	0.472	3.98***	0.698	11.84 ***	0.401	3.99***
Health5	0.263	3.60 ***	0.421	2.97***	0.312	4.87 ***	0.302	2.81***
No obs	7725		4817		7892		5281	
Log likelihood	-3547.12		-1747.96		-3880.13		-2612.75	
χ^2 (p-value)	0.000		0.000		0.000		0.000	
Pseudo-R^2	0.259		0.261		0.209		0.180	

Notes: See notes to Table 2.

Table 7.
Disabled selectivity corrected wage equations including health problem type, 2003

	Male				Female			
	Work-limited disabled		Non-work-limited disabled		Work-limited disabled		Non-work-limited disabled	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Constant	1.724	11.78 ***	1.936	20.00***	1.405	10.79 ***	2.011	23.00***
Region 1	-0.169	-4.26 ***	-0.152	-5.13***	-0.176	-4.91 ***	-0.140	-5.31***
Region 2	-0.159	-4.89 ***	-0.158	-6.98***	-0.160	-5.50 ***	-0.116	-5.65***
Region 3	-0.102	-2.83 ***	-0.141	-5.58***	-0.154	-4.91 ***	-0.125	-5.25***
Region 4	0.019	0.39	-0.167	-5.00***	-0.038	-0.08	-0.092	-2.82***
Region 6	-0.085	-2.70 ***	-0.113	-4.77***	-0.121	-4.24 ***	-0.097	-4.55***
Region 7	-0.078	-2.32 **	-0.125	-5.19***	-0.131	-4.46 ***	-0.103	-4.61***
Region 8	-0.114	-3.43 ***	-0.122	-5.19***	-0.151	-4.97 ***	-0.123	-5.88***
Region 9	-0.124	-2.63 ***	-0.157	-4.90***	-0.167	-4.37 ***	-0.116	-4.08***
Region 10	-0.075	-2.18 **	-0.137	-5.61***	-0.167	-5.19 ***	-0.106	-4.96***
Occupation 2	-0.002	-0.05	-0.079	-3.29***	0.066	1.59	0.094	3.36***
Occupation 3	-0.170	-4.82 ***	-0.158	-6.77***	-0.064	-1.79 *	-0.070	-2.84***
Occupation 4	-0.359	-8.24 ***	-0.370	-11.70***	-0.276	-8.20 ***	-0.251	-11.00***
Occupation 5	-0.374	-11.05 ***	-0.379	-16.40***	-0.344	-5.36 ***	-0.420	-8.99***
Occupation 6	-0.405	-7.22 ***	-0.534	-12.00***	-0.384	-10.40 ***	-0.427	-16.00***
Occupation 7	-0.521	-10.07 ***	-0.461	-12.1***	-0.366	-9.60 ***	-0.344	-12.6***
Occupation 8	-0.517	-14.85 ***	-0.496	-20.3***	-0.452	-8.20 ***	-0.410	-9.22***
Occupation 9	-0.578	-16.57 ***	-0.578	-22.3***	-0.463	-12.32 ***	-0.465	-16.90***
Industry 1	0.078	0.88	-0.178	-2.56**	0.164	1.12	-0.038	-0.35
Industry 2	0.322	4.45 ***	0.213	4.11***	0.108	0.86	0.245	2.94***
Industry 3	0.224	5.17 ***	0.082	2.44**	0.139	2.94 ***	0.061	1.65*
Industry 4	0.283	5.64 ***	0.119	3.17***	0.325	4.15 ***	0.106	2.05**
Industry 5	0.146	3.33 ***	-0.041	-1.17	0.013	0.33	-0.110	-3.47***
Industry 6	0.244	5.25 ***	0.102	2.83***	0.182	3.34 ***	0.158	3.92***

Industry 7	0.315	6.98 ***	0.182	5.22***	0.206	5.11 ***	0.134	4.21***
Industry 8	0.126	2.75 ***	0.028	0.83	0.053	1.44	0.006	0.21
Days illness	-0.022	-2.22 **	-0.007	-0.62	-0.035	-3.91 ***	-0.012	-1.16
Married	0.036	1.53	0.079	4.79***	-0.008	-0.45	-0.002	-0.14
Experience	0.017	5.08 ***	0.026	8.34***	0.018	6.61 ***	0.019	8.32***
Exp squared	0.000	-4.31 ***	0.000	-7.72***	0.000	-6.55 ***	0.000	-8.22***
Qual 1	0.343	6.74 ***	0.371	12.1***	0.485	9.50 ***	0.343	11.00***
Qual 2	0.204	4.01 ***	0.168	5.26***	0.302	6.48 ***	0.213	7.27***
Qual 3	0.141	3.78 ***	0.093	3.66***	0.201	5.02 ***	0.051	1.98**
Qual 4	0.119	2.94 ***	0.038	1.38	0.167	4.67 ***	0.046	1.93*
Qual 5	0.107	2.84 ***	0.018	0.65	0.133	3.74 ***	0.025	1.04
Small firm	-0.122	-5.85 ***	-0.116	-7.46***	-0.062	-3.47 ***	-0.085	-6.36***
Part-time	-0.141	-4.88 ***	-0.065	-2.39**	-0.035	-1.99 **	-0.067	-4.96***
White	0.019	0.43	0.030	0.82	0.073	1.72 *	-0.092	-2.83***
Tenure	0.012	4.10 ***	0.012	5.63***	0.014	4.54 ***	0.013	5.80***
Tenure squared	0.000	-1.84 *	0.000	-2.21**	0.000	-1.07	0.000	-2.30**
Public sector	0.061	1.79 *	-0.008	-0.31	0.105	4.40 ***	0.043	2.38**
Overtime	0.003	1.93 *	0.006	5.67***	0.003	1.32	0.005	3.68***
Social housing	-0.090	-2.01 **	-0.032	-0.95	-0.041	-1.03	-0.033	-1.20
Home owned	0.045	1.24	0.054	1.82*	0.069	2.02 **	0.021	0.79
Home mortgaged	0.085	2.35 **	0.088	3.42***	0.111	3.51 ***	0.022	0.94
Health1	0.098	2.06 **	0.000	-0.01	0.051	1.38	0.011	0.28
Health2	0.156	2.62 ***	-0.019	-0.36	0.052	0.98	-0.033	-0.71
Health3	0.108	2.24 **	-0.003	-0.08	0.102	2.56 **	0.021	0.59
Health5	0.121	2.61 ***	-0.011	-0.22	0.020	0.55	0.014	0.38
Lambda	0.020	0.35	0.027	0.48	0.156	3.06 ***	-0.015	-0.40
No obs	2399		3886		2470		3741	
RSS	421.56		588.77		354.55		448.98	
F (p-value)	0.000		0.000		0.000		0.000	
$\bar{R}^2$	0.449		0.518		0.448		0.523	

Notes: See notes to Table 4.

Table 8.
Disabled and non-disabled wage decompositions

(a) Work limiting disabled and non-disabled, 1997

	Male					**Female**				
Mean prediction non-disabled	1.994					1.739				
Mean prediction disabled	1.716					1.584				
Raw differential	0.278					0.155				
- due to endowments	0.117					0.076				
- due to coefficients	0.183					0.087				
- due to interaction	-0.022					-0.008				
Ω:	0	1	0.5	0.928	*	0	1	0.5	0.93	*
Unexplained	0.161	0.183	0.172	0.182	0.187	0.079	0.087	0.083	0.087	0.086
Explained	0.117	0.095	0.106	0.096	0.092	0.076	0.068	0.072	0.069	0.069
% unexplained	58.0	65.9	62.0	65.4	67.1	51.0	56.2	53.6	55.8	55.2
% explained	42.0	34.1	38.0	34.6	32.9	49.0	43.8	46.4	44.2	44.8
Differential due to selection variable	-0.100					-0.023				

(b) Work limiting disabled and non-disabled, 2003

	Male					**Female**				
Mean prediction non-disabled	2.267					2.057				
Mean prediction disabled	2.101					1.771				
Raw differential	0.166					0.286				
- due to endowments	0.094					0.082				
- due to coefficients	0.086					0.216				
- due to interaction	-0.013					-0.013				
Ω:	0	1	0.5	0.899	*	0	1	0.5	0.901	*
Unexplained	0.072	0.086	0.079	0.084	0.089	0.203	0.216	0.21	0.215	0.216
Explained	0.094	0.081	0.087	0.082	0.078	0.082	0.069	0.076	0.071	0.070
% unexplained	43.5	51.4	47.5	50.6	53.4	71.1	75.7	73.4	75.3	75.6
% explained	56.5	48.6	52.5	49.4	46.6	28.9	24.3	26.6	24.7	24.4
Differential due to selection variable	-0.001					-0.165				

(c) Non-work-limited disabled and non-disabled, 1997

	Male					Female				
Mean prediction non-disabled	1.994					1.739				
Mean prediction disabled	1.946					1.703				
Raw differential	0.048					0.036				
- due to endowments	-0.010					-0.001				
- due to coefficients	0.065					0.033				
- due to interaction	-0.007					0.004				
Ω:	0	1	0.5	0.090	*	0	1	0.5	0.918	*
Unexplained	0.058	0.065	0.061	0.059	0.059	0.037	0.033	0.035	0.033	0.033
Explained	-0.010	-0.017	-0.013	-0.011	-0.011	-0.001	0.003	0.001	0.003	0.003
% unexplained	120.7	135.3	128.0	122.0	123.3	101.7	91.6	96.7	92.4	92.2
% explained	-20.7	-35.3	-28.0	-22.0	-23.3	-1.7	8.4	3.3	7.6	7.8
Differential due to selection variable	-0.061					-0.023				

(d) Non work limited disabled and non-disabled, 2003

	Male					Female				
Mean prediction non-disabled	2.267					2.057				
Mean prediction disabled	2.270					2.022				
Raw differential	-0.003					0.035				
- due to endowments	-0.015					0.005				
- due to coefficients	0.019					0.028				
- due to interaction	-0.006					0.002				
Ω:	0	1	0.5	0.154	*	0	1	0.5	0.857	*
Unexplained	0.013	0.019	0.016	0.014	0.014	0.03	0.028	0.029	0.028	0.028
Explained	-0.015	-0.021	-0.018	-0.016	-0.017	0.005	0.007	0.006	0.007	0.007
% unexplained	449.9	668.4	559.1	483.6	491.7	86.1	79.5	82.8	80.4	80.0
% explained	-549.9	-768.4	-659.1	-583.6	-591.7	13.9	20.5	17.2	19.6	20.0
Differential due to selection variable	-0.002					-0.016				

Table 9.
Gender wage decompositions

(a) 1997

	Work-limited disabled					**Non-work-limited disabled**					**Non-disabled**				
Mean prediction males			1.716					1.946					1.994		
Mean prediction females			1.584					1.703					1.739		
Raw differential			0.133					0.243					0.256		
- due to endowments			0.037					0.088					0.083		
- due to coefficients			-0.040					0.114					0.109		
- due to interaction			0.136					0.042					0.063		
Ω:	0	1	0.5	0.503	*	0	1	0.5	0.521	*	0	1	0.5	0.496	*
Unexplained	0.096	-0.040	0.028	0.027	-0.026	0.156	0.114	0.135	0.134	0.056	0.172	0.109	0.141	0.141	0.087
Explained	0.037	0.173	0.105	0.105	0.159	0.088	0.130	0.109	0.110	0.188	0.083	0.147	0.115	0.115	0.168
% unexplained	72.4	-30.5	20.9	20.6	-19.7	63.9	46.7	55.3	54.9	22.9	67.5	42.7	55.1	55.2	34.1
% explained	27.6	130.5	79.1	79.4	119.7	36.1	53.3	44.7	45.1	77.1	32.5	57.3	44.9	44.8	65.9
Differential due to selection variable			0.102					0.063					0.026		

(b) 2003

	Work-limited disabled					**Non-work-limited disabled**					**Non-disabled**				
Mean prediction males			2.101					2.270					2.267		
Mean prediction females			1.771					2.022					2.057		
Raw differential			0.329					0.247					0.210		
- due to endowments			0.074					0.096					0.092		
- due to coefficients			0.194					0.097					0.084		
- due to interaction			0.061					0.054					0.033		
Ω:	0	1	0.5	0.493	*	0	1	0.5	0.509	*	0	1	0.5	0.486	*
Unexplained	0.255	0.194	0.224	0.225	0.192	0.151	0.097	0.124	0.124	0.070	0.118	0.084	0.101	0.101	0.055
Explained	0.074	0.136	0.105	0.105	0.137	0.096	0.151	0.123	0.124	0.178	0.092	0.126	0.109	0.109	0.155
% unexplained	77.4	58.8	68.1	68.2	58.4	61.0	39.2	50.1	49.9	28.3	56.0	40.1	48.0	48.3	26.1
% explained	22.6	41.2	31.9	31.8	41.6	39.0	60.8	49.9	50.1	71.7	44.0	59.9	52.0	51.7	73.9
Differential due to selection variable			-0.132					0.019					0.032		

(c) 1997, including health problems

	Work-limited disabled					Non-work-limited disabled				
Mean prediction male	1.737					1.952				
Mean prediction female	1.573					1.703				
Raw differential	0.164					0.250				
- due to endowments	0.038					0.086				
- due to coefficients	0.004					0.118				
- due to interaction	0.122					0.046				
Ω:	0	1	0.5	0.503	*	0	1	0.5	0.522	*
Unexplained	0.126	0.004	0.065	0.065	0.009	0.164	0.118	0.141	0.140	0.062
Explained	0.038	0.160	0.099	0.099	0.155	0.086	0.131	0.109	0.110	0.188
% unexplained	76.8	2.5	39.7	39.4	5.6	65.7	47.3	56.5	56.1	24.8
% explained	23.2	97.5	60.3	60.6	94.4	34.3	52.7	43.5	43.9	75.2
Differential due to selection variable	0.071					0.057				

(d) 2003, including health problems

	Work-limited disabled					Non-work-limited disabled				
Mean prediction male	2.093					2.273				
Mean prediction female	1.775					2.020				
Raw differential	0.318					0.253				
- due to endowments	0.078					0.097				
- due to coefficients	0.183					0.099				
- due to interaction	0.057					0.057				
Ω:	0	1	0.5	0.493	*	0	1	0.5	0.510	*
Unexplained	0.240	0.183	0.212	0.212	0.180	0.156	0.099	0.128	0.127	0.074
Explained	0.078	0.135	0.106	0.106	0.138	0.097	0.154	0.125	0.126	0.179
% unexplained	75.6	57.6	66.6	66.7	56.6	61.8	39.1	50.5	50.2	29.4
% explained	24.4	42.4	33.4	33.3	43.4	38.2	60.9	49.5	49.8	70.6
Differential due to selection variable	-0.121					0.013				

Table 10.
Decompositions of changes over time

(a) Males

	Work-limited disabled					**Non-work-limited disabled**					**Non-disabled**				
Mean prediction 2003			1.960					2.129					2.126		
Mean prediction 1997			1.716					1.946					1.994		
Raw differential			0.244					0.183					0.132		
- due to endowments			0.036					0.035					0.023		
- due to coefficients			0.209					0.146					0.100		
- due to interaction			-0.001					0.002					0.009		
Ω:	0	1	0.5	0.517	*	0	1	0.5	0.576	*	0	1	0.5	0.423	*
Unexplained	0.208	0.209	0.208	0.208	0.200	0.148	0.146	0.147	0.147	0.142	0.109	0.100	0.105	0.105	0.101
Explained	0.036	0.035	0.035	0.035	0.044	0.035	0.037	0.036	0.036	0.041	0.023	0.032	0.027	0.027	0.031
% unexplained	85.3	85.7	85.5	85.5	81.9	80.8	80	80.4	80.3	77.6	82.7	75.9	79.3	79.8	76.7
% explained	14.7	14.3	14.5	14.5	18.1	19.2	20	19.6	19.7	22.4	17.3	24.1	20.7	20.2	23.3
Differential due to selection variable			-0.098					-0.057					0.001		

(b) Females

	Work-limited disabled					**Non-work-limited disabled**					**Non-disabled**				
Mean prediction 2003			1.631					1.882					1.916		
Mean prediction 1997			1.584					1.703					1.739		
Raw differential			0.047					0.179					0.177		
- due to endowments			0.053					0.038					0.042		
- due to coefficients			-0.009					0.143					0.140		
- due to interaction			0.003					-0.003					-0.004		
Ω:	0	1	0.5	0.527	*	0	1	0.5	0.588	*	0	1	0.5	0.434	*
Unexplained	-0.006	-0.009	-0.007	-0.008	-0.014	0.140	0.143	0.142	0.142	0.132	0.136	0.140	0.138	0.137	0.131
Explained	0.053	0.056	0.055	0.055	0.061	0.038	0.036	0.037	0.037	0.047	0.042	0.038	0.040	0.040	0.046
% unexplained	-12.1	-19.4	-15.7	-15.9	-29.2	78.5	80.0	79.3	79.4	73.8	76.4	78.7	77.5	77.4	73.8
% explained	112.1	119.4	115.7	115.9	129.2	21.5	20.0	20.7	20.6	26.2	23.6	21.3	22.5	22.6	26.2
Differential due to selection variable			0.137					-0.013					0.160		

Table 11.
Productivity and discrimination components of the non-disabled - work-limited disabled wage gap

(a) Males

	1997	**2003**
Predicted log earnings gap	0.278	0.166
Difference in observable characteristics	0.092 (33%)	0.078 (47%)
Difference in unobservable characteristics	0.128 (46%)	0.075 (45%)
Discrimination	0.059 (21%)	0.014 (8%)

(b) Females

	1997	**2003**
Predicted log earnings gap	0.155	0.286
Difference in observable characteristics	0.069 (45%)	0.070 (24%)
Difference in unobservable characteristics	0.053 (34%)	0.188 (66%)
Discrimination	0.033 (21%)	0.028 (10%)

Table 12.
Employment effects of wage differences

	Male		**Female**	
	1997	**2003**	**1997**	**2003**
Employment probability				
- Non-disabled discriminatory	0.852	0.845	0.705	0.716
- Non-disabled non-discriminatory	0.852	0.846	0.705	0.716
- Disabled discriminatory	0.213	0.258	0.234	0.267
- Disabled non-discriminatory	0.241	0.282	0.220	0.252
Employment elasticities				
- Non-disabled	0.223	-0.003	-0.084	-0.044
- Disabled	0.416	0.300	-0.833	-1.000
Wages				
- Non-disabled discriminatory	8.861	11.653	6.569	8.910
- Non-disabled non-discriminatory	8.723	11.505	6.531	8.811
- Disabled discriminatory	7.468	9.704	5.799	7.934
- Disabled non-discriminatory	9.976	13.050	6.244	8.417

Appendix 1. Variable definitions

Dependent variables	
(Log) hourly wages	Gross weekly earnings divided by usual hours worked per week
Employment participation	Dummy variable equal to 1 if individual has a positive hourly wage, 0 else
Human capital variables	
Experience	Years of (potential) labour market experience (age minus school-leaving age)
Tenure	Years in present job
Qual 1	Dummy variable, equals 1 if highest qualification is university degree or higher degree
Qual 2	Dummy variable, equals 1 if highest qualification is other degree
Qual 3	Dummy variable, equals 1 if highest qualification is A level
Qual 4	Dummy variable, equals 1 if highest qualification is O level
Qual 5	Dummy variable, equals 1 if highest qualification is other qualification
Qual 6	Dummy variable, equals 1 if no qualifications (base)
Industry variables	
Industry 1	Agriculture and fishing
Industry 2	Energy and water
Industry 3	Manufacturing
Industry 4	Construction
Industry 5	Distribution, hotels etc
Industry 6	Transport communication etc
Industry 7	Banking and finance
Industry 8	Public administration
Industry 9 and 10	Other (base)
Occupation variables	
Occupation 1	Managers and senior officials (base)
Occupation 2	Professional occupations
Occupation 3	Associate professional and technical
Occupation 4	Administrative and secretarial
Occupation 5	Skilled trades
Occupation 6	Personal service occupations
Occupation 7	Sales and customer service occupations
Occupation 8	Process, plant and machine operatives
Occupation 9	Elementary occupations
Region variables	
Region 1	North
Region 2	Yorkshire and Humberside
Region 3	East Midlands

Region 4	East Anglia
Region 5	South East and London (base)
Region 6	South West
Region 7	West Midlands
Region 8	North West
Region 9	Wales
Region 10	Scotland

Health variables

Days illness	Number of days off sick in the reference week (0-7)
No of health problems	Number of health problems reported
Health 1	Dummy variable, equals 1 if main health problem affects limbs
Health 2	Dummy variable, equals 1 if main health problem affects sight/hearing
Health 3	Dummy variable, equals 1 if main health problem affects skin, breathing and organs
Health 4	Dummy variable, equals 1 if main health problem is mental health (base)
Health 5	Dummy variable, equals 1 if main health problem is other

Housing status variables

Social housing	Dummy variable, equals 1 if renting from non-private sector
Home owned	Dummy variable, equals 1 if home owned outright
Home mortgaged	Dummy variable, equals 1 if home mortgaged
Private rent	Dummy variable, equals 1 if renting from private sector (base)

Other variables

Age	Age (years)
Married	Dummy variable denoting marital status, equals 1 if married
Dependent children	Number of dependent children in household if head of household or spouse (0 else)
Other earner	Dummy variable, equals 1if there is another individual in household has a labour market income
White	Dummy variable denoting ethnic group, equals 1 if white
Small firm	Dummy variable denoting firm size in which employed, equals 1 if less than 20 employees in firm
Public	Dummy variable, equals 1 if individual is employed in the public sector
Part-time	Dummy variable, equals 1 if employed part time
Overtime	Amount of usual overtime (hours)

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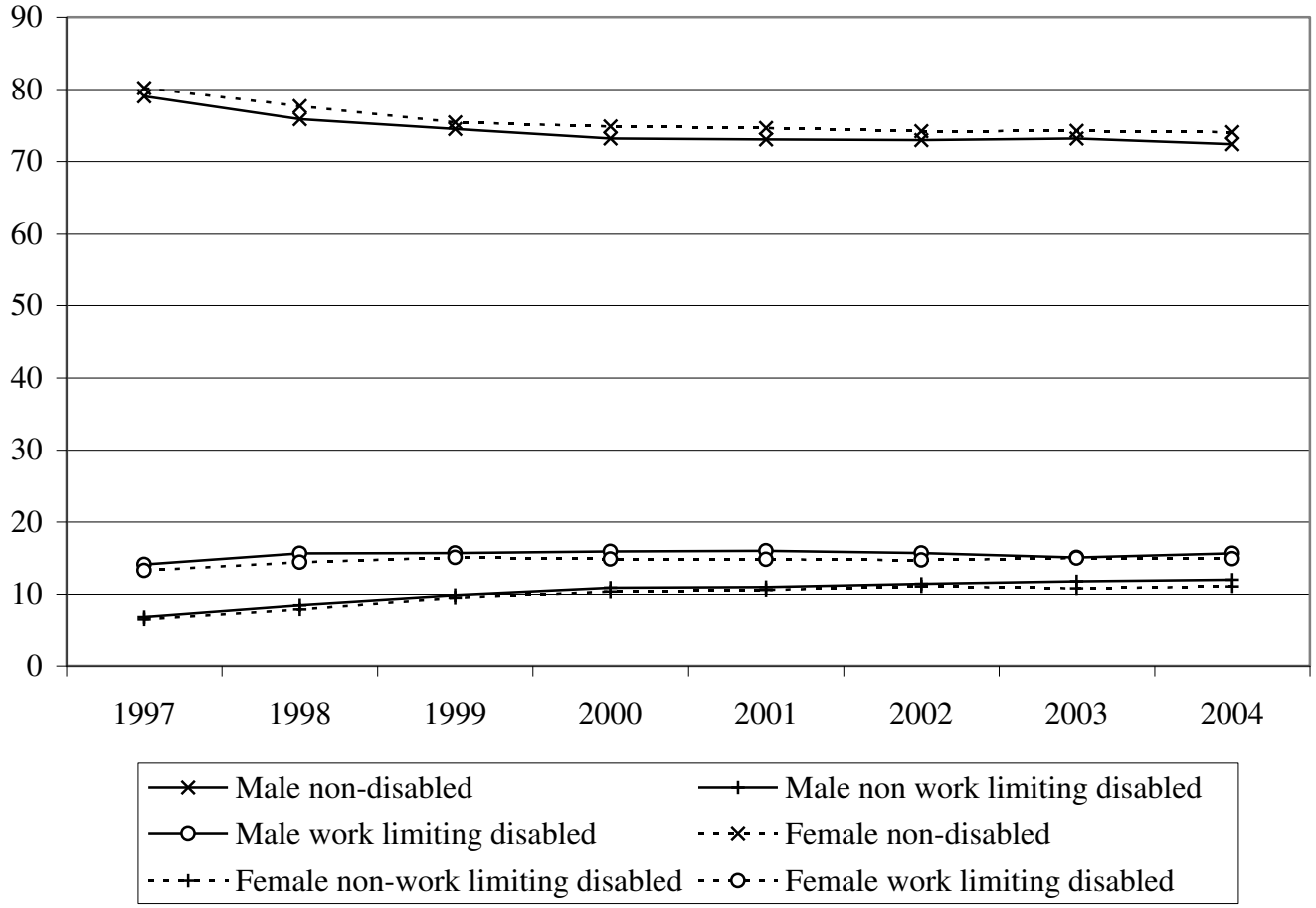
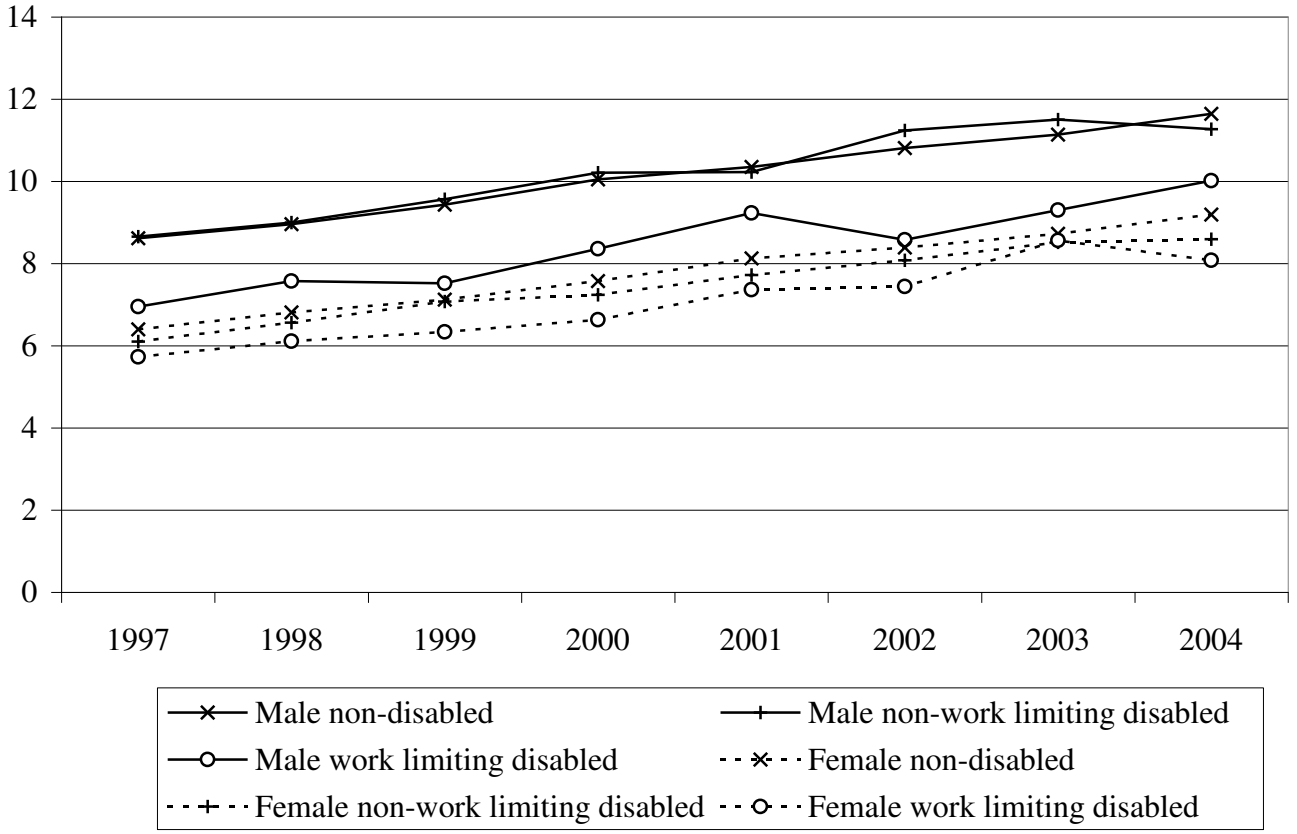
Fig. 1. Disability rates in Great Britain 1997-2004



Source: Authors' calculations based on UK LFS, Summer quarter.

Fig. 2. Average hourly pay in Great Britain 1997-2004



Source: Authors' calculations based on UK LFS, Summer quarter.